

OCCUPATIONAL HEALTH & SAFETY MANAGEMENT PLAN

**CONTRACT PACKAGE: FOR CONSTRUCTION OF
ACCESS ROADS AND BRIDGES**

1125 MW DORJILUNG HYDROPOWER PROJECT

11th April, 2025
Revision. 00



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Detail of the Documents

DOC. No.	Title	Pages
Contract Package: DOC-01	Occupational Health and Safety Management Plan (OHSPM)	91

Revision History

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ABBREVIATIONS

DHPP	Dorjilung Hydropower Project
OHSMP	Occupational Health and Safety Management Plan
OHS	Occupational Health and Safety
ISO	International Organization for Standardization
ILO	International Labour Organization
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
OHSA	Occupational Health and Safety Administration
LTI	Lost Time Injury
TRIFR	Total Recordable Injury Frequency Rate
LTIFR	Lost Time Injury Frequency Rate
PR	Processes
SOP	Standard Operating Procedures
ITA	International Tunneling Associations
KPIs	Key Performance Indicators
TBT	Toolbox Talk
JHA	Job Hazard Analysis
WAH	Work at Height
SSW	Short Service Worker
PPE	Personal Protective Equipment
ERP	Emergency Response Plan
WB	World Bank
GIIP	Good International Industry Practice
GRM	Grievance Redressal Mechanism
IFA	International Finance Corporation
IA	Implementation Agreement
PM	Project Manager
OE	Owner's Engineer



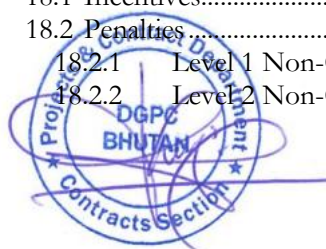
TERMS AND DEFINITIONS

Accident	An unplanned event or a chain of events, which has caused injury, illness, damage and loss to property, the environment, and/or reputation.
Employee/s	Any person(s) who is/are directly employed by the DHPP to work on the Project and who receives, or is entitled to receive, remuneration.
First Aid Case	Any work-related injury that involves no lost workdays, restricted workdays or medical treatment but which requires and receives first aid treatment.
Incident	An event or chain of events that has caused or could have caused injury, illness and/or damage (loss) to property, the environment, reputation, or third parties. An incident involves the release or near release of a hazard. Incident refers to both: actual incidents and near-misses.
Injury	Physical harm or damage to a person resulting from traumatic contact between the body of the person and an outside agency, or from exposure to environmental factors.
Total Recordable Injury Rate (TRIR):	Measures the total of no. of recordable incidents per 200,000 work hours. Includes fatality, lost time injuries, Restricted Work Case, Medical Treatment Injury beyond first aid.
Lost Time Injury Rate (LTIFR):	Measures only lost time incidents per 1,000,000 work hours (Includes injuries where worker cannot return to work the next scheduled shift).
Lost Time Injury (LTI)	Lost Time Injury refers to incidents resulted in a Fatality and Lost Work Day Case.
Near Miss	An incident which resulted in no injury or illness and/or damage (loss) to people, asset, the environment.
Observation	Breaches of safety rules and regulations that are found during construction activities.
Property Damage	A direct loss of or damage to plant, equipment, tools or materials resulting from an incident.
Reportable/Recordable Incident	Medical Treatment Case (MTC), Restricted Word Day Case (RWDC), Lost Work Day Case (LWDC), Fatality.
Restricted Work	Any work-related injury or illness where the professional doctor recommends the employee not perform one or more of their job's routine duties as a direct result of injuries sustained.
Contractor	A person or company that has been hired to carry out work directly for the DHPP under contract, or employed by an employment agency, that are under contract to carry out work for DHPP.
Subcontractor	A person or a company that has been hired to perform a task for a prime contractor at the DHPP.



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1 Introduction

The Dorjilung Hydropower Project (DHPP) is a planned 1,125 MW run-of-river hydroelectric facility located on the Kurichhu River in eastern Bhutan, spanning the Lhuentse and Mongar districts. The project will feature a 139.5m high roller compacted concrete dam (85 m above riverbed) impounding a reservoir capacity of approximately 44 million cubic meters. Water will be conveyed through a 14.97 km headrace tunnel on the right bank connecting to an underground powerhouse with 6 Francis units with short twin tailrace tunnels (360 m), proposed approximately 10 km upstream of the existing 60 MW KHP, with the dam wall located approximately 36 km upstream of KHP.

The total projected cost of the project, including financing expenses, is around \$1.5 billion. The construction is expected to take approximately 6½ years, supported by funding from the World Bank and other international financial institutions.

To facilitate the construction of main hydropower facilities, a total of about 29.1 km of access roads to various construction sites (adit portals, dam, diversion location, etc.) which includes high submergence and realignment and existing road improvements will be required to be constructed within the Project area, as listed below in Table 1.

Table 1: Proposed New Access Road & Bridge Construction

SN	Description	Length (KM)
1	Construction of new roads including improvement of farm roads	29.1
2	Construction of Compact 200 Bailey bridge 1	54.9 m
3	Construction of Compact 200 Bailey bridge 2	57.9 m

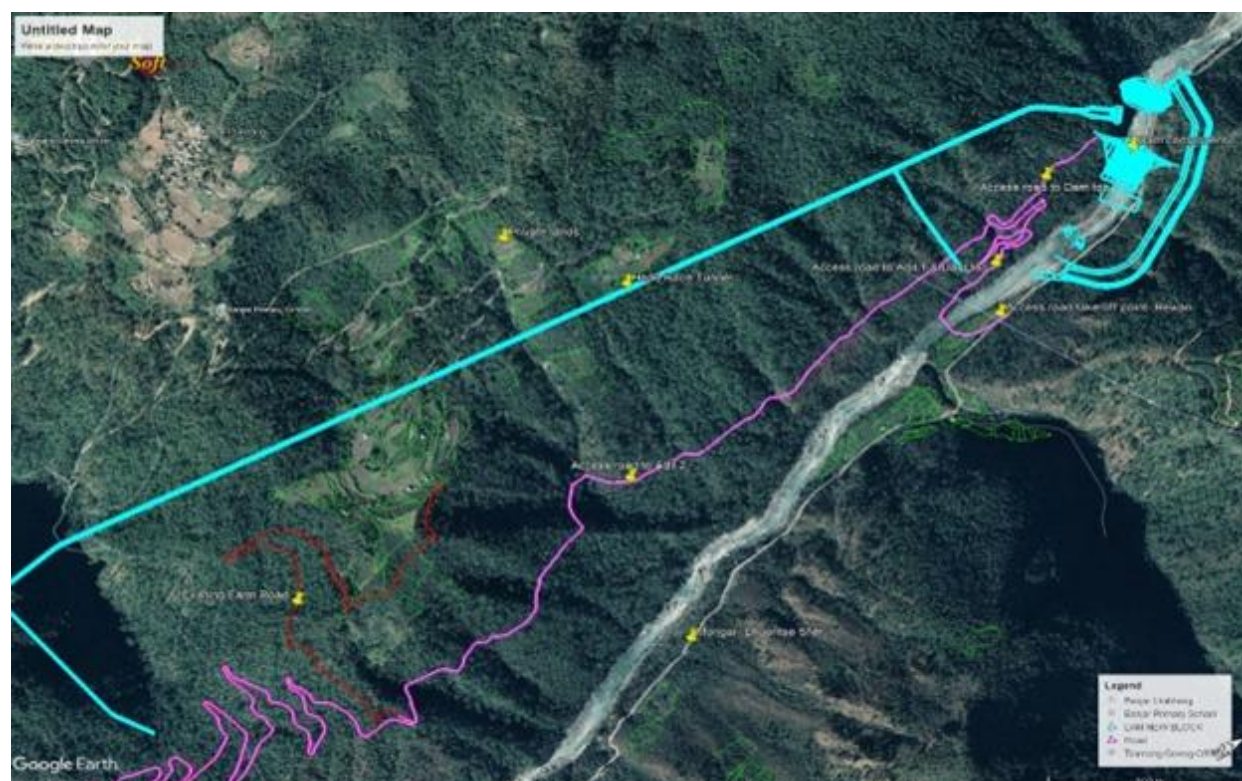


Figure 1: Access Road to Adit 1, Dam top, Adit 2



2 Purpose

This OHSMP document sets out the Occupational, Health and Safety requirements for the construction of proposed new access road and bridges works for the Project. It is the key tool to manage the OHS risks associated with the above construction work of the Project.

Its core purpose and the objectives of the this OHSMP is to;

- Ensure that all construction activities are planned, carried out, controlled and directed with consistent, approved, health, and, safety management practices, procedures or standards.
- Define a formal and integrated Contractor's practical approach to manage OHS risks during the construction phase of the Project.

3 Scope

OHSMP is applicable on all operational activities related to the project Infra 1: Access Road and Bridges. Specifically, this will address following high-risk activities:

- Drilling and Blasting operations and related activities such as storage and transfer of explosives from magazine to the blast site.
- Operation of road going vehicles including passenger vehicles, loaders, excavators, and dumpers.
- Maintenance and operation of the site camp and other facilities like workshop and first aid center.
- Mobile equipment operation including lifting.
- Work at height and in the slope.
- Lifting with crane.
- Excavation Operation and associated risk to community members.

Financial, logistics and engineering design aspects of the project are out of scope of this OHSMP.

In this document 'Shall' and 'Must' signifies a mandatory requirement whereas 'Should' will be used to mention a recommended practice that Contractor management will strive to accomplish.

4 Laws and Regulations

Contractors shall ensure that all applicable local regulations, guidelines and standards that are part of their contractual obligations are always complied with. The relevant laws and regulations regarding the Occupational Health and Safety are listed below in Table 2.

Wherever there is a conflict in guidance of the above, the more stringent safety requirement shall be applied.

Table 2: Relevant Laws and Regulations

Requirements	Project related Schedule/rule/ and other
Occupational Health and Safety Management Plan (OSHMP)	Health and Safety requirement mentioned in the contract document.
Labour and Employment Act, 2007, Dept. of Labour, Ministry of Industry, Commerce and Employment	The Bhutan Labor Act of 2007, under chapter IX clause 34 to 41 emphasizes the importance of occupational health and safety in the workplace. These provisions oblige employers take necessary measures to create a safe and healthy environment for their employees.
Occupational Health and Safety Regulations 2022, Department of Labour, Ministry of Industry, Commerce and Employment.	This Regulation establishes standards on Occupational Health, Safety and Welfare that must be met by all workplaces within the coverage of the Labour and Employment Act of Bhutan 2007.
Safety Regulation 2008 of Electricity Regulatory Authority (ERA)	This Regulation makes provisions for the design, construction, operation and maintenance of electric power plant and equipment in a manner that is Electrically Safe.



Road Safety and Transport Regulations 2021.	This Regulations set out traffic rules and regulations, and minimum vehicle safety requirements to be followed by the employers, drivers and operators.
Explosive Rules, Ministry of Home Affairs, Royal Govt. of Bhutan	This Explosive Rules sets out the minimum requirements of import, transport, handling, storage and usage of explosives to ensure rightful use and prevent accidents.
World Bank Environmental and Social Management Framework 2018, ESS-2: Labor and Working Conditions	This standard obliges the Developer to develop and implement written labor management procedures applicable to the project. These procedures will set out the way in which project workers will be managed, in accordance with the requirements of national laws. The standard also emphasizes measures relating to occupational health and safety to be applied to the project activities which includes identification of potential hazards to project workers, particularly those that may be life threatening, provision of preventive and protective measures, training to project workers and maintenance of training records, documentation and reporting of occupational accidents, diseases and incidents, emergency prevention and preparedness and response arrangements to emergency situations and remedies for adverse impacts such as occupational injuries, deaths, disability and disease.
World Bank Environmental and Social Management Framework 2018, ESS-4: Community Health and Safety	This standard put emphasis on community exposure to risks and impacts of project and includes road safety risks; risks associated with security personnel as well as addressing water-related, communicable and non-communicable diseases that can result from projects activities and have impact on project labor as well as the community.
World Bank Group Health and Safety, General Guidelines, 2007	This guideline provides technical guidance and examples of Good International Industry Practice (GIIP) to help employers achieve acceptable environmental, health, and safety performance, focusing on preventing or minimizing risks to human health and the environment.
International Good Industry Standards (e.g., OSHA, ANSI).	

5 Occupational Health and Safety Management Plan

5.1 Policy

The Contractor's operating policies are the top-level document that outlines their vision for managing operations and Occupational Health and Safety (OHS) to protect the community and all individuals throughout the different phases of construction.

5.1.1 Our Human Rights Policy

- We believe we have a responsibility to respect human rights and can play a positive role in the communities where we operate. To this end, we commit to respect human rights as set out in the United Nations Universal Declaration of Human Rights and the International Labour Organization (ILO) Declaration on Fundamental Principles and Rights at Work, as well as adhere to the principles set out in the United Nations Guiding Principles on Business and Human Rights, the Voluntary Principles on Security and Human Rights and the International Finance Corporation's Performance Standards.
- We recognize we must continually assess the human rights context of our activities, including impacts that we may cause and those to which we may contribute or be directly linked. This determines the



prevention, mitigation and remedy measures required, including using leverage in our business relationships.

- We recognize, respect and abide by all labor, child labor and employment laws and expect our subcontractors and other third-party companies to meet the same standards. These include prohibitions on child labor, forced labor and discriminatory behavior.
- We value and respect the traditions and the culture of the many different communities in which we do business.
- We believe our business activities should contribute to the economic well-being and quality of life. We recognize the effect that our activities may have on local communities, and we value and strive to engage in a meaningful way with the communities where we do business to help ensure we positively contribute to the welfare of the local communities.
- Contractor will endeavor to conduct business with communities who share our values and business principles.

5.1.2 OHS Policy

This Statement has been prepared to define the way in which Contractor intends to manage, comply, and implement all aspects of Occupational, Health and Safety, the associated regulations, legislation and client requirements. Contractor recognizes the importance of Occupational, Health and Safety in the successful operation of its project activities.

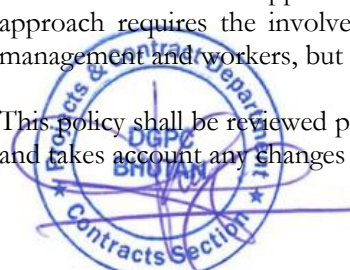
We are committed to fostering a culture where occupational health and safety are integral values, encouraging all our workers to work safely and uphold the belief that every incident is preventable.

To achieve this goal, we commit to:

- Provide leadership, commitment, and accountability in occupational health and safety (OHS) during entire phases of the construction activities.
- Provide, so far as is reasonably practicable, safe methods / systems of work, safe working conditions and healthy environment that preserves the health and safety of its workers and the surrounding communities.
- Provide all required resources, including financial resource, to ensure the full and proper implementation of this OHSMMP.
- Identify hazards, assess the OHS risk level, and apply the necessary measures to eliminate or control them as low as possible.
- Strive for ongoing and continual improvement of its performance in managing occupational health and safety.
- Communicate the contents of the policy to all employees with the intent that employees are made aware of their individual health and safety obligations.
- Investigate all incidents and near misses to determine the cause and prevent similar incidents.
- Regular safety audits, inspections, and drills shall be conducted to foresee and mitigate potential risks.
- Engage in open and transparent communications on occupational, health and safety matters for all workers.
- Provide training and / or instruction as may be necessary to personnel at all levels.
- Comply with all legal and other requirements on Occupational Health and Safety Management System.

We are committed to supporting the implementation of this OHSMMP while recognizing that the success of our approach requires the involvement and cooperation on all Health and Safety matters, not only between management and workers, but also between each worker and his or her co-workers.

This policy shall be reviewed periodically to ensure that it remains relevant and appropriate to the Contractor and takes account any changes in legislation or changes to employer's policy.



5.1.3 Alcohol and Drug Policy

The use of alcohol and illegal drugs shall be strictly forbidden on all construction sites. All workers on the construction site shall be made to comply with the following;

- No worker shall be allowed to distribute, possess, consume, or use alcohol or illegal drugs on the work site or in any vehicle or any other equipment.
- No worker shall be allowed to report to work or be at work under the influence of any drug, or substance that may cause impairment and/or will affect their ability to work safely
- No worker shall be allowed to misuse prescription or non-prescription drugs while at work. If a worker is taking a prescription or non-prescription drug for which there is a potential unsafe side effect, he has an obligation to report such potential to the supervisor.
- Project Management reserves the right to conduct searches of premises and worksites where there are reasonable grounds to conclude there is or has been use or possession of substances prohibited under this Policy.
- Any person taking medication that can affect or restrict their ability to do their job safely must advise and must discuss with his/her direct supervisor.
- Smoking at work places should be banned except in designated smoking areas which are equipped with the smoking signs and trash cans, and possession of lighters and matches should be prohibited before entering at work areas.
- Contractor at our discretion will conduct 'Reasonable Cause Suspicion Testing' or 'drug and alcohol breathing tests', if there are evident reason to believe that the person in question is impaired.
- We shall also conduct Post Incident Alcohol and Drug testing to rule out if this may be a contributory factor in the incident.

5.1.4 Business Conduct and Ethics Code

Following are our Business Conduct and Ethics Code built on our core values and highlights the principles that guide our business conduct.

Ethical decision making

Ethical decision making is essential to the success of our company. Some decisions are obvious and easy to make; others are not. By asking ourselves the questions below can help us to make the right ethical decisions.

Four yes answers are required to qualify an action as ethical.

1. Is it legal?
2. Is it consistent with company policies? If the proposed action does not comply with company policy, you should not do it.
3. Is it in best interests of my co-workers, the company, and the community?
4. If it were made public, would I be comfortable?

If the answer to any of these questions is "No", STOP. If you're not sure: speaks to the Project Manager.

5.1.5 Our Values

Diversity and Inclusion

We will not discriminate on the basis of race, religion, color, national origin, age, sex, gender identity, disability, political preference, membership or non-membership in any lawful organization.



Integrity and Trust

We are honest with ourselves and others and honor our commitments. We trust, respect and support each other. We earn the trust of our colleagues and partners by operating with the highest ethical standards in all we do.

Partnership

We build trusting and mutually beneficial relationships by collaborating with our communities, customers, suppliers and other business partners.

Protect People and the Environment

We place the highest priority on the health and safety of our people, communities, the environment and protection of our assets.

5.2 Objectives and Targets

Following is the OHS objectives develop for the Infra 1 Project in 2025, and that Contractors shall strive to achieve the goal of zero harm and benchmark themselves with good industry practice by implementing robust safety practices at every phase of the construction:

- Safe operation with Zero harm to community members and workers.
- Meet or exceed the contractual safety obligations.
-

A project specific measurable targets has been established to achieve above mentioned objectives. The targets established for the Infra 1 Project in 2025, for the Contractors, are as following:

- Total Recordable Injury Rate of 2.0 or less.
- Lost Time Injury Frequency Rate of 1.5 or less.

Contractor's Senior Management (Project Manager, Construction Manager, and Project Engineer) shall commit to achieve the above-mentioned targets. There are selected leading and lagging indicators that will be used in accomplishment of these targets. Following are some leading indicators showing senior management commitment.

- All Project Manager complete 1 Walk-through Inspection per month.
- All Construction Managers/Project Engineer/ OHS Officer complete 2 Walk-through Inspections per month with their assigned Health and Safety Manager.
- All OHS supervisors complete 1 site inspection weekly.
- Conduct daily Toolbox Talk (TBT) meetings before commencement of work, with attendance recorded using the TBT record form.
- Organize Occupational Health and Safety (OHS) Committee meetings once every month, with formal documentation of meeting minutes.
- Ensure that all contractor management personnel and workers attend and complete the Project OHS Induction program.
- Achieve compliance with all contractual and statutory obligations, with fewer than five improvement notices issued by the employer or regulatory authorities throughout the contract period, and no issuance of stop work orders.
- Ensure 100% issuance and proper usage of Personal Protective Equipment (PPE) at the site, supported by documented records.
- Investigate and report all incidents promptly and in accordance with established procedures.
- Maintain a clean, well-organized, and hazard-free workplace at all times throughout the construction site.



5.3 OHSMP Management and Maintenance

This OHSMP provides the comprehensive framework for the Contractors to meet their contractual obligations to achieve safe work. OHSMP will be a live document and undergo review and updates when any of the following happens:

- There is a change in the scope of the project, or
- A six-monthly periodic review, or
- There is a change in construction methodology/technique based on site condition, or
- Following a significant OHS hazard or a major accident, and instructed by the DHPP Engineer.
- At the end of the Project (to allow for improvements in subsequent projects).

Contractor's OHS Officer is responsible for the review and update.

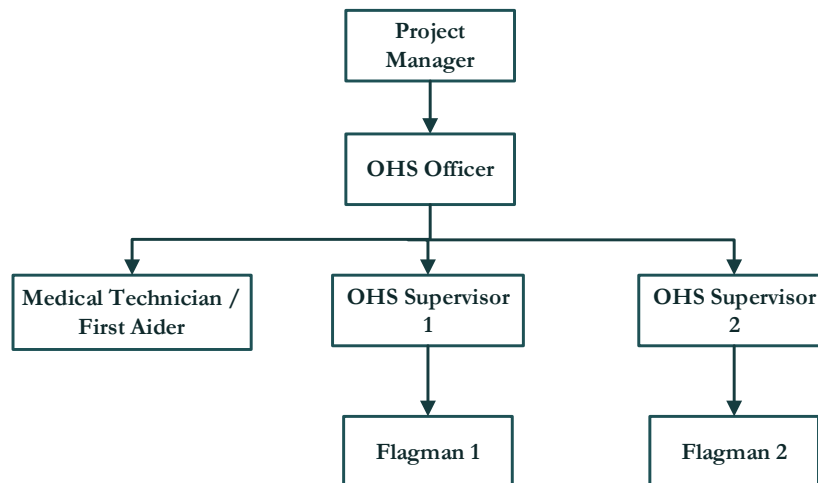
In addition, Contractor can also prepare, submit and implement OHS sub plans and standard operating policies (SOPs) to address specific construction hazards either as a separate document or as part of the Method Statement.

All relevant OHS documents and tools are available with the OHS Officer of the Project.

6 OHS Organization

Although the OHS officer holds primary responsibility for the operation and implementation of the OHSMP, managing OHS at a construction site cannot be done alone. An effectively structured OHS team is crucial for ensuring Occupational Health and Safety. At a minimum, the OHS team should be organized as depicted in the organogram below:

6.1 OHS Organogram



6.2 Roles and responsibilities

6.2.1 Project Manager of Contractor / Contractor:

- Overall accountability for the development, implementation and maintenance of this OHSMP.
- Accountable for allocation of sufficient resources for the execution of this plan.
- Ensure that empowered and competent personnel are available for the execution of this plan.
- Make sure that Contractor's Senior Leadership (all Directors, Construction Managers and other line management personnel) are fully aware of OHS responsibilities.
- Demonstrate visible leadership, walk to talk behavior to reinforce the implementation of this OHSMP.
- Attend monthly OHS Committee Meeting and monitor the performance through leading and lagging indicators.



- Discourage achievement of operational results at the cost of safety violations.
- Develop a conducive culture where Personnel are authorized to STOP* unsafe work without fear of retribution.
- Ensure that Work Observation program is utilized, and all incidents are fully investigated.
- Review the Summary of incidents, ensure that Root Causes are being identified and resources are provided for the closure of Preventive and Corrective Actions.
- Encourage reward and recognition where personnel demonstrate safe behavior or identify hazards and fairly apply disciplinary process when personnel cut short.

**ILO COP 2.2.12. Where there is an imminent danger to the safety of workers, the employer should take immediate steps to stop the operation.*

6.2.2 OHS Officer

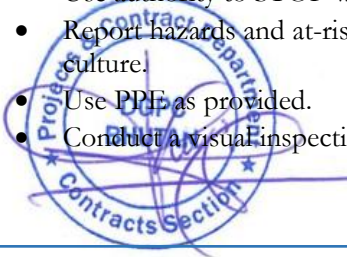
- Be a Subject Matter Expert of this OHSMP. Provide training and awareness regarding the implementation of this OHSMP that includes risk register.
- To be familiar with all local, national, and international laws that is applicable to Operations.
- Raise concern in monthly OHS committee meeting regarding implementation of controls stipulated in this OHSMP.
- Provide training to contractor's staffs and workers on this OHSMP. Conduct regular sessions for all project team members to inculcate the requirements of this OHSMP.
- To report to the Contractor's Management Team on implementation progress, monthly KPIs.
- To ensure that sufficient training and induction of all personnel is being provided and maintained.
- To ensure that visit induction is given to all visitors before they are allowed to visit the site.
- To develop the OHS awareness of all personnel employed on the project and ensures their participation in all aspects of the health and OHS program.
- Provide guidance to employees regarding their emergency response responsibilities.
- Review of OHS management plan every six months.

6.2.3 OHS Supervisors

- Conduct Job Hazard Analysis at each construction site.
- Perform the assigned inspections and discuss the findings with OHS Officer.
- Ensure communication procedure and system to communicate emergency events to site technical supervisor and emergency authorities (e.g., Incident Response Center IRC and/or Police, health centers).
- Communicate with construction site personnel to help them understand the hazards of the site and understand the demands of the operating personnel about OHS matters.
- Ensure that the controls stipulated in PTW are implemented and STOP the work when critical controls are missing or compromised.
- Discuss JHA and conduct effective Tool Box Talk with all workers. Ask questions to ensure that they have a good understanding.
- Conduct worksite observations, discuss safety concerns with workers.
- Develop a culture where it is safe to speak up and provide the time, people and resources to respond to OHS concerns identified by their workers. They are also responsible for escalating issues that can't be resolved by the workers or at the supervision level.
- Responsible for making an incident scene safe and secure and for ensuring that hazards, near misses and incidents are entered into the reporting system.
- Ensure all workers use appropriate PPEs and training how to use them.

6.2.4 Workers

- Conduct Personal Risk Assessment Take 5 and do not proceed to work if unsafe to do.
- Use authority to STOP work if observe an unsafe work by fellow worker or SSW.
- Report hazards and at-risk behavior as and help Contractor management to develop a conducive safety culture.
- Use PPE as provided.
- Conduct a visual inspection of equipment in the beginning of the operation.



- Ensuring that equipment is deenergized before working on a piece of equipment.
- Ensuring that they wear appropriate PPE for the activity that they undertake.
- Be aware and mindful of hazards related to any work activity, do not undertake a job or task if physically or mentally not fit.
- Do not undertake a job if not competent to do so.
- Raise improvement opportunities.
- Report near misses and actual incidents immediately to the supervisor.

6.2.5 Flagman

- Direct vehicles, construction equipment, and pedestrians safely around work zones using flags, signs, and hand signals.
- Ensure compliance with traffic control plans and safety regulations.
- Stop, slow, or redirect traffic as necessary to prevent accidents.
- Maintain constant communication with equipment operators, truck drivers, and other workers.
- Use radios, hand signals, or pre-agreed signals to coordinate traffic flow.
- Alert workers about approaching vehicles or potential hazards.
- Monitor the work zone for potential dangers and take proactive measures to prevent accidents.
- Ensure that barriers, cones, and signs are correctly placed and visible.
- Report any safety concerns to supervisors or site managers.
- Follow workplace safety regulations and local traffic laws.
- Maintain logs or records of incidents, near misses, or traffic-related issues.
- Wear required PPE, such as reflective vests and helmets.
- Respond quickly to accidents or emergencies by alerting authorities and assisting as needed.
- Guide emergency vehicles through or around work zones safely.

7 Risk Management

7.1 Risk Register

The Contractor shall develop, documented and implemented risk register covering all hazards associated with each work activity are identified, the associated risks assessed and measures for eliminating or minimizing and monitoring the risk. The Contractor's risk register for the access road construction is outlined in Annexure VI.

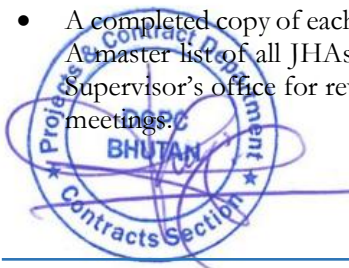
The Contractor shall implement and strictly comply with all the required safety measures as outlined under risk register of Contractor's OHSMP.

The Contractor's OHS Officers is responsible to regularly review and update as the Project progresses, and maintained it as a living document that is ongoing and proactive.

7.2 Job Hazard Analysis

Alongside risk register, a Job Hazard Analysis (JHA) shall be required to conduct for every operation before work begins or when changes are made to the job method. JHA is task-specific analysis to identify hazards associated with a particular job or activity and develop controls;

- Contractor's Supervisor, Foreman or Workers familiar with the specific task shall conduct JHA as per the template provided in Annexure I. Crews will not begin any operation without a JHA that has been reviewed with the crew, and signed off by the work supervisor / foreman. Any operation found without a current, reviewed JHA on hand will be shut down.
- A completed copy of each JHA must be kept by the foreman at the activity location during the operation. A master list of all JHAs, including their status and latest revision dates, should be maintained in the Supervisor's office for review. At a minimum, the crew's JHA must be reviewed weekly during toolbox meetings.



8 OHS Management System Processes and SOPs

OHS Management System Process and SOPs forms a framework of the Contractor's OHS management plan and these are the second and third-tier documents after policies. However, for the preparatory works, separate processes and SOPs are not required as the requirements are adequately reflected in the risk register under control measures.

8.1 OHS in Method Statement

In addition, the Contractor shall include an OHS Chapter in each Method Statement. This OHS Chapter will be based on - Risk Assessment and Management of the site and specific to construction methods to be followed by the Contractor. This Work Method Statement will be reviewed by the OHS Specialists of the Engineer and confer approval along with other technical parameters to be reviewed by the technical team of the Engineer. Each revision of the method statement should also be reviewed by the OHS Specialists and their concurrence will be required to get them approved.

9 Emergency Response Plan

The Contractor will prepare an emergency evacuation plan for each construction site. This evacuation plan must provide for emergency procedures, testing of emergency procedures, and training and instruction on these procedures. Emergency procedures shall include the following points:

- An effective response to an emergency;
- Evacuation procedures;
- Notifying emergency service organizations at the earliest opportunity;
- Medical treatment and help;

These procedures shall be tested at least two (2) times per year on a random basis in consultation with the Project Engineer. The Contractor shall also prevent firearms being brought on to Site.

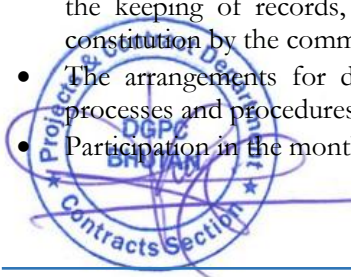
The Contractor will coordinate with the local government rescue emergency services and shall ensure the following On-Site Rescue emergency requirements are made promptly and diligently

10 Occupational Health and Safety Management Committee

For the purpose of implementing the OHSMP, the Contractor shall constitute a duly empowered committee which shall convene monthly under the chairmanship of the Occupational Health and Safety Staff. The composition of the committee shall be to the approval of the Engineer, who may, if in his opinion the committee is not carrying out its duties with due diligence, order that a new committee be reconstituted.

The following list illustrates some important activities of the committee:

- Hold regular meetings (at least one in a month or as many meetings as required).
- Identify workplace hazards and recommend remedial action(s).
- Respond to employee concerns regarding health and safety.
- Assist management in the development and implementation of safe work practices and emergency procedures.
- Participate in the development, implementation and monitoring of health and safety policies, processes and procedures to ensure healthy and safe working conditions and the management of hazardous conditions.
- Participate in workplace inspections.
- Participate in notification, investigation and recording of incident, as appropriate.
- Participate in resolving work refusals.
- Promote health and safety education and training.
- The arrangements for the frequency and occasions of routine and special meetings of the Committee, the keeping of records, rights and access to information and the right to amend the committee constitution by the committee in agreement with the Engineer.
- The arrangements for disseminating information, training and supervision to ensure the policies, processes and procedures.
- Participation in the monthly safety inspection of the Engineer and the Employer.



Members of the Committee shall be adequately trained in health and safety in order for them to contribute fully to all committee activities. In deciding the ideal committee size, the Contractor shall consider:

- Total number of workers.
- Number of different trades or unions involved.
- Complexity of the operation.
- Degree of hazard in work.
- Whether all segments of work force are represented (management, supervisors, male workers, female workers, office staff).
- Whether the committee encompasses adequate knowledge of conditions, processes, practices.

11 Medical Facilities and First Aid

11.1 General

The Contractor shall provide, maintain and operate the following:

- One (1) First Aid station at or close to the areas of the Site where most of the work is being carried out. The First Aid station shall be suitably equipped with medical supplies and staffed during all Site working periods by competent medical personnel who shall have direct voice communication with a district medical center or hospital, and shall be assisted as required by some of the Contractor's employees with first aid qualification.
- Contractor's medical technician will coordinate with local medical center/hospital for ambulance movement in case of aa medical emergency.
- One (1) medical health technician, must have at least 6 months of experience as a para-medical from the local hospital.

11.2 First Aid Boxes

The Contractor shall provide and maintain in ready condition adequate boxes of first aid materials together with stretchers at prominently marked locations within 200m of each working site or as required by the Engineer. The minimum contents of each first aid box, as per the OHSW 2022 Regulation are listed below in the Table 3;

Table 3: Contents of First Aid Box

SN	Items	No. of Employee	
		1- 50	> 51
1	Small sterilized dressings	12	24
2	Medium size sterilized dressings	6	12
3	Large size sterilized dressing	6	12
4	Large size sterilized burn dressings	6	12
5	(1/2oz.) Sterilized cotton wool	6 Pkts.	12 Pkts
6	(2oz.) Bottle containing a two per cent alcoholic solution of iodine	1	2
7	(2oz.) Bottle containing Betadine (antiseptic solution) having the dose and mode of administration indicated on the label	1	2
8	Roll of adhesive plaster	1	2
9	A snake bite lancet	1	1
10	Torch light	1	1
11	Pair of scissors	1	1
12	Tablets Aspirin (5gms)	2 dozen	4 dozen
13	Burn ointment	2 tubes	4 tubes
14	Dettol	2 phials (about 2 ozs)	4 phials
15	Bandages 4 inches wide		12 rolls
16	Bandages 2 inches wide		12 rolls

SN	Items	No. of Employee	
		1- 50	> 51
17	Triangular bandages	2	6
18	Packets of safety pins	1	2
19	A supply of suitable splint		Yes
20	Tourniquet		1

The first aid box will be under the charge of trained & certified first aider. The designated first aider will be responsible for maintaining the register, and shall record the use of first aid items based on template, similar to the prescribed proforma in Annexure II.

11.3 Pre-employment Medical Screening and Follow-up

The Contractor shall institute and operate a medical screening and examination system for prospective employees. The screening system shall be established and monitored in consultation with the Employer, the Ministry of Health and the Ministry of Labor.

The Contractor shall also conduct follow-up medical examination of the employees, who are involved in high-risk construction works, as for example, underground works, blasters, drillers, workers in batching plant, excavation workers, welders, flagman, cooks, etc. Follow-up examination should be conducted at least once in a year, for hearing losses, eye sight, breathing etc. Any deterioration of health condition, must be followed-up by the specialist physician visits at the expense of the Contractor.

12 Workers Welfare

12.1 Transport of Workers

The Contractor shall be responsible for, and make provision for the safe vehicular transport of all staff and workers between their residences and their work areas, and vice versa. Transportation of workers shall be by passenger vehicles such as buses, vans or others approved by the Engineer.

Overloading of passengers on the vehicles shall be prevented. Transportation of workers by trucks with no fixed seats and hard roof is prohibited.

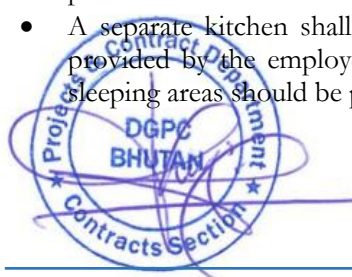
12.2 Site Facilities

The Contractor shall provide the following facilities for the workers at all Construction sites:

- An adequate and convenient water supply shall be provided for drinking, cooking, bathing, and laundry purposes. Safe drinking water should comply with Bhutan National Environmental Commission standards;
- Resting areas with appropriate shades during work breaks and extreme weather conditions;
- Appropriate lunch and dinner area with seating arrangements;
- Dedicated change rooms at construction sites; and
- Portable toilets at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities should be at least 6 m away from storm drain system and surface waters. These portable toilets should be cleaned at a minimum once a day and all the sewerage should be pumped from the collection tank once a day and should be brought to the common septic tank for further treatment.

12.3 Accommodation

- The temporary living accommodation for employees should be constructed at the safest place where there is no risk of flooding, landslide, collapse hazards, falling boulders and other elements.
- A separate accommodation facility for male and female should be provided.
- There should be one room for every 4 employees. Adequate headroom and movement space shall be provided. The size of the room shall be at least 3.5 square meter per person (refer drawing).
- A separate kitchen shall be provided if employees cook by themselves. However, if the meals are provided by the employer, a common dining room, canteen or mess room, located away from the sleeping areas should be provided.



- A separate pour-flush toilet cum bathroom, washing facilities for male and female shall be provided. There shall be one toilet cum bathroom for every six users. The size of the toilet shall comply with the Building Code of Bhutan/ the attached drawing.
- The floors of each room shall be constructed of wood or concrete. Floor shall be provided with good finishes. All wooden floors shall be elevated not less than 1 foot above the ground level at all points to prevent dampness and to permit free circulation of air beneath.
- The walls of the bed room and the kitchen must be constructed preferably with ply boards of at least 10 mm thickness (or equivalent) and CGI/ PPI Sheet for roofing. For toilets, both walls and roof shall be constructed with CGI/ PPI sheets (or equivalent).
- There should be adequate natural light during the daytime and adequate artificial light (refer drawing).
- Adequate ventilation to ensure sufficient movement of air in all conditions of weather and climate.

12.4 Health and Hygiene

- The accommodation should maintain good sanitation and hygiene (proper drainage system, proper waste management, good housekeeping, etc.).
- Measures should be taken to prevent the spread of diseases, especially communicable diseases.

12.5 Safety at temporary accommodation site

- Any electricity supplied for the accommodation should abide by the Electricity Act of Bhutan, 2001.
- There should not be any exposed live wire or unattended electrical switches & sockets in the living accommodation.
- Every cable used for any purpose should have a plug at one end.
- Combustible, explosive, and highly flammable materials should not be stored in the living accommodation.
- Fire safety measures should be taken, including installing and maintaining fire equipment.
- As far as possible, floors, walls, ceilings and equipment should be constructed to minimize health risks. The accommodation shall be provided and maintained for the entire contract period including the time extension if any or the delays. The complete work of providing temporary living accommodation to workers at construction sites shall be treated as an item of work under Occupational Health and Safety. The construction shall be durable taking into account local conditions, such as liability to earthquakes, flood and landslide. The materials used for accommodation will remain as the property of the bidder upon completion of the project. The reuse of the materials may be permitted as long as these reused items serve the intended purpose or as approved by the procuring agency.

13 Personal Protective Equipment

The Contractor shall provide personal protective equipment (PPE) for workers and all staffs, such as safety shoes, helmets, masks, breathing apparatus, gloves, protective clothing, goggles, full-face eye shields, and ear protection, and must ensure that PPE are worn at all times by their workers while at jobsite. The minimum PPE requirements for working at Construction site includes;

- Safety Helmet
- Safety Boots, and;
- Safety Reflective Jackets / Vest

The type and specifications of PPEs required for the entire duration of the Project are as listed below in the Table 4;



Table 4: Personal Protective Equipment and their Specifications

Sl.	Items	Standards or equivalent
1	Safety Shoes	ANSI Z41.1-1991
2	Helmet	ANSI Z89.1-1986
3	Reflective Jackets / Vest	ANSI Z107.1-2015
4	Life Jackets	UL1191, PFD Type I
5	Welding Shields	ANSI Z87.1-1989
6	Gloves (Welding)	ANSI Z105.1-2021
7	Gloves (Heavy lifting)	ANSI Z105.1-2021
8	Full Body Harness	ANSI Z359.1-2020
9	Face Mask	ANSI Z87.1-1989
10	Ear muffs/plugs	ANSI S3.19/CSA Z94.2-2014

The OHS Officer of the Contractor is responsible for providing training to their workforce for proper use and maintenance of PPE and the damaged PPE shall be replaced without the cost of the workers.

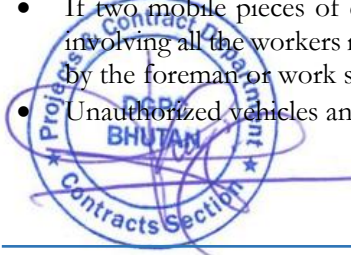
The Contractor shall maintain the proper register of issuance of PPE for their workers, in the similar format as per the prescribed proforma in Annexure III.

14 Health and Safety Rules

14.1 Vehicle and Driving Safety

The following minimum requirements shall apply to the vehicle & driving safety on the construction site;

- All drivers and operators of earthmoving equipment must be certified and valid licensed holder, must be medically fit and properly trained.
- Pre-use check and daily maintenance for the equipment must be completed prior to operation of the equipment.
- Comply with local traffic rules and regulation at all times.
- Comply with site speed limits at all times. The speed limit for DHPP project is 30 km/hr. outside & 10 km/hr. within construction areas and inside tunnels.
- Use of cell phones while driving vehicles or operating mobile equipment is restricted.
- Chock on wheels is to be installed when the risk identifies that the vehicle can move. Hand brakes are to be used at all times when the vehicle is stopped or parked when on the project areas. Reverse Park at all times.
- Give way to larger vehicles.
- Stop & sound the horn at blind corners or where the path or intended path is obstructed and when entering or leaving work site.
- All material must be properly secured prior to transport of the load.
- Operator must get eye contact with any pedestrians who may encroach on your intended route.
- Must always park the equipment in a safe zone and turn off machine before exiting.
- All forks are to be lowered to the ground when the vehicle is parked.
- A worker working with the crane must always get eye contact with equipment operators before approaching equipment.
- Wear high visibility clothing at all time in construction work zone and operational areas.
- Ensure that no one is standing within the radius of the boom or jib and its load.
- Make sure that no one is standing or walking under suspended loads.
- Maintain a safe distance from other equipment.
- If two mobile pieces of equipment are used to do some work within 5 meters of each other, a JHA involving all the workers must be conducted prior to commencing the work and the JHA must be signed by the foreman or work supervisor.
- Unauthorized vehicles and machineries are not permitted within restricted construction sites.



- Contractors must maintain valid license, vehicle fitness, safety, and maintenance certificates of all trucks and loaders.
- Additional requirements not listed in this provision might be warranted if the project risk profile changes.

14.2 Work at Height

The following requirement shall apply to all work at height conducted on site;

- Any work performed at an elevated position greater than 6 feet (2m) or higher or where a person could fall and sustain an injury is considered as work at height.
- Contractor should not work at height unless it is safe to do so.
- A detailed risk assessment must be conducted and the work must commence only after introduction of appropriate controls, i.e. fall prevention and protection system.
- All workers including Contractor and their workers shall as reasonably as possible, minimize working at height by designing equipment so that it can be assembled from the ground. All the prefabrication work must be as much as possible carried out at ground level.
- The priority shall be platforms or scaffolds with guard rails; however, some areas may require the use of fall arrest systems.
- Scaffolds and guard rails must be erected and utilized in accordance with the manufacturer's guidelines or recommendations.
- Any non-standard or custom-built scaffolds, ladders, or work platforms may only be assembled and used with prior approval from the Project Manager.
- Additional requirements not listed in this provision might be warranted if the project risk profile changes.

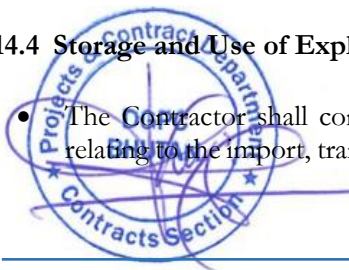
14.3 Excavation, Slope Stability and Landslide Management

The following requirement shall apply to all excavation work conducted on site;

- Excavation permit must be obtained before starting on excavations.
- All work is to be done by a trained competent workforce.
- Ensure that all operators of earth moving equipment hold the appropriate licenses.
- Maintain good housekeeping around excavations.
- The sides of the excavations must be sloped or battered for holes greater than 1.5m deep, sloping and shoring will be defined by the contractor and approved by Project Manager based on soil conditions encountered.
- Spoils and any material must be at least 1.2m from the edge of the excavation.
- All the workers engaged in excavation and trenching must use High visibility personal protective equipment, at all times.
- During work in excavations, ensure that there is clear coordination and communication between workers in excavation and equipment operators.
- Nobody or other equipment/vehicle must work within 3.0 meters of operational heavy equipment including the swing arms of cranes, back hoes etc. The contractor shall perform a risk assessment to ensure that no physical contact is made between the equipment and pedestrians or workers working around.
- Limit or stop work in extreme weather conditions.
- Controlled blasting techniques should be used to avoid damage/fracture to rock mass.
- Rock falling due to blasting should be in minimum.
- Continuously monitor and identify new landslides areas.
- Rigid barricading and warning signage must be posted at high risk/hot spots, and around excavations deeper than 0.5m, which can only be removed to allow excavation work to continue.
- Additional requirements not listed in this provision might be warranted if the project risk profile changes.

14.4 Storage and Use of Explosives

- The Contractor shall comply with all laws (Explosive Rules, 1989) and security regulations in force relating to the import, transportation, storage and use of explosives including the provision of magazines



at locations approved by the appropriate authorities. The magazines shall conform in all respects to all laws in force regarding the erection, maintenance and guarding of magazines.

- The Contractor shall obtain all necessary licenses as may be required for the import, transportation, storage and use of explosives and do all things necessary to ensure compliance with the laws in force relating to dangerous goods.
- Blasting shall begin only when proper precautions are taken for the protection of workers and surrounding communities.
- All the blasting operations of the Contractor shall be conducted by qualified, experienced and certified blaster or under the direct supervision of a certified blaster.
- The Blaster shall conduct the blasting operation in safe and sequential manner in accordance with Sequential Explosive Management Standard (SEM) and Industry best practices.
- The Blaster shall ensure that any unauthorized persons shall be located a safe distance (e.g. at least 300 metres) away from the blasting point. Before the detonation takes place, the Blaster shall check that there are no people inside the controlled area.
- If there has been a failure in the blasting operation, only competent personnel may be allowed on site to do the work necessary to detonate the explosive, or completely redo the blasting.
- The Contractor will indemnify the Employer against all claims for damage caused by blasting.
- Explosives and detonators shall not be transported in the same vehicle.
- Explosives shall be stored in suitable magazines in approved location. Detonators shall be kept in a separate magazine. The magazine shall be plainly marked with large letters EXPLOSIVES DANGEROUS in English, Dzongkha and any other relevant languages, and shall be locked and guarded at all times. Keys to unlock the magazines shall be kept only by magazine keepers. Each magazine shall have around it a cleared area suitably barricaded with a security fence with guards.
- Each magazine keeper shall be competent, trustworthy, and familiar with the handling, transportation, care, and storage of explosive and detonators, and shall be responsible for maintaining the cleared area around the magazine. No magazine keeper shall be allowed to work more than ten hours in any twenty-four-hour period and shall not be required or allowed to perform any other duty that will interfere with his duties as a magazine keeper.

14.5 Warning of Blasting

- The Contractor shall install and operate a siren of sufficient volume to be easily heard above the general site noise from all points within a radius of 1 km of surface blasts.
- The Contractor shall notify local communities before blasting, at least one day prior to any surface blasting activity and shall address any concerns that they may have. The Contractor shall also issue a warning siren 30 minutes before the blast, again about 1 minute before the blast, and an “all clear” siren shortly after the blast, which can be heard up to approximately 1 kilometer from the surface blast site.
- The Contractor shall present to the Employer, the Engineer, the surrounding villages, police station nearest to the Site a weekly schedule of his blasting operations in a written form. When the schedule will be changed, he shall inform the modified schedule to the same not later than twenty-four (24) hours before the first ignition of the day.
- The Contractor shall submit details of his blasting procedures to the Engineer for consent and shall ensure that such procedures are adhered to at all the times.

14.6 Barricading and Securing Worksites

- Contractors will ensure construction activities do not take place until relevant/active work site areas have been secured.
- Supervision Engineers will verify that contractors have the necessary and activity-specific protocols to physically secure site.
- Active worksites will be required to have controlled access and should be fenced. Guards will be recruited to restrict free entry and monitor entry and exit points. Lighting be installed especially in areas prone to accident.
- Free access by community members should be restricted, and visitors should not be allowed at site unless accompanied by and/or permitted by an authorized person



- All work edges at height and “drop offs” including high-risk areas near excavation site must be barricaded with suitable purpose designed physical and visual barrier with warning and no trespassing signs should be placed at appropriate locations (taped barriers alone are not sufficient).
- Barricade must be strategically placed so that the hazard is totally surrounded and clearly visible to all persons approaching from any direction.
- Barricades must be sturdy enough to withstand environmental conditions like wind, water flow, and heavy equipment movement. Barricades should be brightly colored and equipped with reflectors for night-time visibility.
- Barricades should be routinely checked and maintained to ensure effectiveness. Damaged or displaced barricades must be immediately repaired or replaced.
- Once the hazard has been fully addressed and eliminated, the barriers must be immediately removed. Barricades should not remain in place if no hazard exists.
- Additional requirements not listed in these provisions might be warranted if the project risk profile changes.

14.7 Housekeeping

- Contractors should implement good housekeeping practices/program.
- Emphasis should be given on proper storage of materials and equipment. Loose materials should not obstruct means of access and egress from workplaces and passages.
- Oil, chemicals or other liquids (including water) which can make workplaces and walkways slippery should be cleaned immediately.

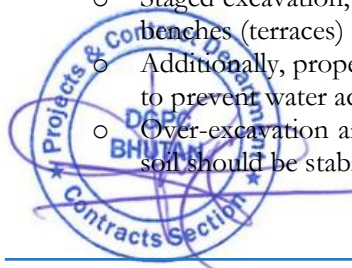
15 Traffic Safety Management

The Contractor shall provide appropriate traffic control and warning signs at strategic locations of the roads to notify vehicular drivers and local communities of traffic risk and hazards, complying with the schedules of signs contained in the Road Safety and Transport Regulations 2021. The Contractor shall provide advance public notifications of blasting schedules and enforce buffer zone, and shall with coordination with regional and local traffic police, regulate the traffic safety in the affected areas of the roads.

16 Community Health and Safety

The Contractor shall undertake at least the following actions to protect the public from operational activities:

- Place warning signs to alert the public to potential dangers near the construction site (e.g., immediately below and near the take-off yard);
- Install appropriate traffic control and warning signs to notify vehicular drivers and local communities of traffic risks and hazards;
- Provide advance public notifications of blasting schedules and enforce a safe buffer zone;
- Implement dust control measures, such as water spraying, to minimize dust in surrounding areas.
- Ensure sufficient lighting around hazardous areas, including water channels, freshly excavated roads, and pit-falls, to maintain visibility at night. In construction zones where a power source is unavailable, photoluminescent safety signs and devices should be utilized to enhance safety.
- Ensure adequate and timely disclosure of information to the local community about high-noise operations, such as heavy machineries and blasting operations.
- Ensure proper disposal of construction waste and debris.
- Excavation and road grading can lead to landslides, posing risks to nearby communities. Therefore, contractors should, as far as practicable, implement safe construction practices, including;
 - Staged excavation, the use of retaining walls to support unstable slopes, and the construction of benches (terraces) on steep slopes to reduce erosion.
 - Additionally, proper drainage systems such as culverts and diversion channels should be installed to prevent water accumulation and soil weakening.
 - Over-excavation and cutting steep slopes beyond safe angles should be avoided, while exposed soil should be stabilized using shotcrete or vegetation.



- Applying soil nailing or rock bolting to secure loose rock faces, reinforcing slopes with anchored mesh to prevent rockfalls, limiting the placement of heavy machinery or materials near unstable slopes, and establishing a community alert system for potential slope failures.
- Security personnel, guards, or watchmen shall be stationed at key locations to enforce safety regulations, prevent trespassing, and minimize vandalism.
- Consultation with officials of local townships officials, agencies and villages to assist in enacting laws or ordinances so that there is adequate enforcement of safety laws and regulations, prohibiting public, fishermen, swimmers or and others from entering hazardous construction sites, and that the public does not misuse or defeat the purpose of the barriers.

17 Site Security Management

17.1 Security Risks

The project is located in remote part of the country. The area has been visited less and is largely devoid of any outside conflict or wars. However, with the commencement of the project and influx of outsiders in the area, the chance of any conflict arising will increase and with this, there will be some security risks in the area.

Not only that, the storage warehouse of the Contractor will have a large stock of different type of construction materials that may attract burglars and thieves. Securing these warehouses will be another priority of the contractor for which deployment of security personnel is a must.

The major security risks may include illegal trespassing, conflict between locals and labors, theft or burglary in storage warehouse and other project areas and possible GBV-SEA/SH issues within the workplace or with the community.

17.2 Mitigation Measures

To minimize these risks, the Contractor shall undertake at least the following measures to maintain the safety and security of all Contractor personnel (workers) and visitors to the Project site;

- The contractor will employ watchmen or security personnel and place at high-risk areas for maintaining the security in the project site, especially the camp areas and equipment storage warehouses to be located in Construction site.
- Keep unauthorized persons off the construction site. Authorized persons shall be limited to the Contractor's and the Owner's personnel, and any visitors with prior notification of the Contractor and approval by the Owner;
- Arrange guided tours whenever required to inform people about Project operations;
- Provide adequate night-time lighting;
- Install a perimeter fencing around the worker's accommodations and storage warehouses with guards to restrict access to public;
- Watchmen or Security personnel will regularly patrol the perimeter and monitor key areas like workers camp areas, equipment storage, warehouses etc. to prevent unauthorized access or theft.
- Ensure that watchmen or security personnel on-site are experienced and trained in security issues.
- The watchmen or security personnel shall receive detailed training about the project site, the local rules and regulations as well as the cultural sensitivity of the site during the initial induction training.
- The use of force by watchmen or security personnel shall be strictly regulated by the employer (Contractor) and comply with local laws and human rights standards, unless when necessary to protect life, prevent serious injury or stop unlawful activity.
- Ensure the project is compliant with IFC Performance Standard 4 and the UN Voluntary Principles on Security and Human Rights.



18 Incentives and Penalties

Contractors must fully adhere to the health and safety requirements outlined in this OHSMP and their contractual OHS obligations. Any disregard for or violation of OHS rules at any management level will not be tolerated on the project. DHPP reserves the right to take appropriate action against contractors for non-compliance with OHS regulations. Conversely, DHPP shall recognize and reward contractors for outstanding OHS performance.

18.1 Incentives

The Employer may grant additional payments to the Contractor at each milestone payment or issue a Certificate of Recognition if the Contractor delivers exceptional performance in selected Key Performance Indicators (KPIs).

18.2 Penalties

The course of action taken in response to a violation depends on whether it was intentional or resulted from system deficiencies. If the violation is system-induced, corrective actions will focus on improving systems and procedures. However, if the violation or non-compliance with OHS requirements is intentional, the following measures will be applied in a progressive manner:

18.2.1 Level 1 Non-Conformance;

For initial violations committed by a worker or contractor, verbal reminders, on-the-spot corrections, or informal discussions will be conducted to address the non-conformance. If such violations persist, formal warnings will be issued, potentially escalating to Level 2 Non-conformance.

18.2.2 Level 2 Non-Conformance;

If a worker or contractor is found to be non-compliant at the level 2 Non-Conformance, they will be served a Notice of Contravention (Non-Conformance Report - NCR) with a specified deadline for rectification. Continued non-compliance or failure to address the notice will result in escalation to Level 3 Non-conformance.

18.2.3 Level 3 Non-Conformance;

For repeated or severe non-compliance:

- Work Suspension: All or part of the work may be suspended until satisfactory corrective action is taken, with no time extension granted for delays caused by the suspension.
- Withholding Payments: Milestone payments may be withheld if the NCR remains unresolved beyond the specified timeframe. If resolved within the given period, no deductions will be made.
- Site Removal or Suspension: The removal or suspension of the offending individual(s) from the site may be enforced at the contractor's expense.
- Right to Appeal: The contractor has the right to appeal to the Engineer for modifications to the Notice of Contravention before its expiration. The Engineer, at their sole discretion, may modify, withdraw, or uphold the notice.

Note: DHPP reserves the right to impose the strictest penalties for any violation if deemed necessary.

19 Incident Investigation and Reporting

Every incident, regardless of severity, must be thoroughly investigated to determine the root causes, and to determine preventive and corrective actions to prevent future incidents. The Contractor shall report all the incidents based on the categorization of types of incidents as detailed in the Table 5, below;



Table 5: Type of Incident and Reporting

Incident Type	Reporting Deadline	Format
Fatality	Within 24 - 48 Hours	Initial notification + Full investigation Report
Serious Injury and Illnesses	Within 24 – 48 Hours	Initial notification + Full investigation Report
Recordable Incident	Internal Tracking	Summary with corrective Actions
First Aid Cases (Non-Recordable)	Internal Tracking	Internal Log Entry
Near Miss (Close Call)	Internal Tracking	Internal Log Entry

The Contractor's OHS Officer and Supervisor shall investigate, complete the investigation report and submit to Project's OHS Manager in accordance with the timeline tabulated above, including recording of all other the incidents in the template similar to the prescribed proforma in Annexure IV – for internal tracking to help continuously improve Occupational Health and Safety during the entire phase of the construction.

20 Monitoring and Performance Indicators

Contractor's OHS team will be responsible for compliance monitoring activities during the construction phase from the contractor side. The OHS performance of the contractor will be monitored and reported monthly based on the following performance indicators.

- Contractual Obligations
- Leading Indicators
- Lagging Indicators

The format for reporting monthly OHS performance of the contractor is detailed under Annexure VI.



Annexure I: Job Hazard Analysis Form

Job Hazard Analysis (JHA) Process		Date:	
Project's Name:			
Contractor's Name:			
Job/Task:			JHA Number:
Analysis by:		Reviewed by:	Approved by:
Required Standards and General Notes			
Required PPE			
Tools & Equipment			
Task/Job Step Breakdown	Potential Hazards/ Injury source (What could go wrong)	Control Method (How can the harm be prevented? Indicate type of PPE as last control.)	Risk= (Severity x Frequency)
1.			
2.			
Job Hazard Analysis Verification (Contract Supervisor reviews and signs prior to work)			
The JHA has been assessed and has confirmed with all workers: • The JHA addresses the significant steps, applicable hazards and the necessary controls. • Workers know and understand the identified hazards for the task, the risk assessment applicable to those hazards and the controls required to be followed. • Workers have the appropriate resources (people and equipment) to do the job safely. • Others that could be affected by the work will be informed.			
(Signature) Preparer (Signature) Reviewer (Signature) Approval			



Annexure II: First Aid Case Log

Name of Injured Employee / Worker _____ Date _____
Location (work site) _____ Time of Injury __: __AM ☐ PM ☐ Name
of the Supervisor _____
Contractor /Subcontractor _____

Incident (briefly describe)

Injury (briefly describe)

First Aid Provided

Any conditions contributing to the incident that need evaluation Yes ☐ No ☐

If yes, please describe

First Aid Provider _____ (Signature) _____

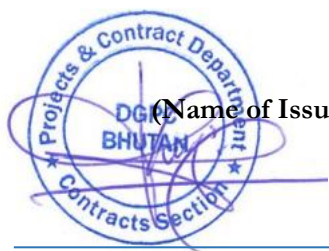
Report completed by _____ (Signature) _____

Note: Only work-related first aid cases are documented on-site. First aid incidents occurring outside the construction site are not recorded or administered in these reports.



Annexure III: PPE Issuance Register

SN	Name of Employee	Date of Issue	Safety Shoes	Safety Helmet	Reflective Jacket/Vest	Life Jackets	Welding Shield	Welding Gloves	Gloves (Heavy Lifting)	Full body Harness	Face Mask	Ear muffs / plugs	Safety Goggles	Others (if any)	Signature / Thumb Impression
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															



(Name of Issuer & Signature)

(Name of the Contractor & Signature)

Annexure IV: Incident Investigation and Reporting Form

Incident Investigation and Reporting Form				
1. Name of the worker:				
2. Job Title				
4. Site/Location:				
5. Date of Incident:		Time:		
6. Date of Report:				
7. Description of the Incident <i>(Provide a clear and detailed account of the accident, including the sequence of events leading up to it)</i>				
8. Cause of the Accident <i>(Detailed narrative of how incident occurred)</i>				
9. Immediate Correction Action				
Follow-up Actions				
SN	Description of Recommended Corrective Measures	Responsibility	Timeline	Date Completed
Investigated by; 1) _____ (Signature) _____ 2) _____ (Signature) _____ 3) _____ (Signature) _____ Report Submitted by; (Name & Signature) Date				



Annexure V: Toolbox Talk Record Form

Toolbox Talk Record Form			
Name of the Activity:			
Site/Location:		Date & Time:	
Number in Crew:		Number attending:	
Supervisors/Managers:			
TBT Conducted by:			
1. Review Last Meeting (Have corrective actions from previous toolbox talks been completed? Yes or No.			
2. Topics Discussed (policies, practices, procedures, hazard assessment):			
3. Issues Raised/Suggestion Offered:			
4. Action(s) to be Taken:			
Attendees Name	Attendees Signature	Attendees Name	Attendees Signature

Supervisor's Remark: _____

Signature: _____



Annexure VI: Monthly Contractor's Safety Performance Report form

Monthly Contractor's Safety Performance Report Form			
Work start Date:		For the Month of:	
Name of the Work:		Report No:	
Contractor's Name:		Date Submitted:	
Particulars	Current Month	Cumulative	Total
Total strength (Staff + Workmen)			
No. of Fatal incident			
No. of Recordable Incident (LTI, MTI, RWT)			
Total No. of Incident			
Total Man Hrs. worked			
Total Man days lost			
No. of Fire Incidents			
No. of First Aid Cases			
No. of Near miss Incidents			
No. of OHS violations			

Safety Activities	Current Month	Cumulative	Year to Date
1 Walkthrough Inspection per month by PM			
2 Walkthrough Inspection per month by OHS Manager			
1 Weekly inspection by OHS Supervisors			
No. of safety training conducted			
Tool Box Talks			
OHS Meetings			

Submitted by; _____ Date: _____
(Contractor's OHS Officer)

Approved by; _____ Date: _____
(Contractor's Project Manger)

Recieved by; _____ Date: _____
(Project's OHS Manger)



Annexure VII: Risk Register

Unit: OHS		Risk Assessment INFRA 1: Lot I, Lot II, Lot III, and Lot IV	<u>Written by:</u> Sherab Jamtsho Head OHS Unit	<u>Validated by:</u> Ugyen Namgyal Project Director
Revisi on No.	Revision Date:	Revision Details	Commented By	Approved By
00	March 2025	1.		



Date: April -2025
Site: Infra 1

Risk Register

Risk Ratings

Risk Matrix				Likelihood				
				Unlikely to occur but known in industry; probability .1%-1%	Likely to occur once or more in life of facility/organization; probability 1%-10%	Likely to occur once every two years or more; probability 10%-50%	Occurs more than once or twice per year, is continuous or certain to occur; probability 50%-80%	Multiple occurrences have happened frequently in the industry; probability >80% & above
				Remote (1)	Possible (2)	Occasional (3)	Likely (4)	Frequent (5)
				1	2	3	4	5
S e v e r i t y	No impact or minor, Temporary discomfort, self-administered first aid treatment or no treatment.	Incidental (1)	1	1	2	3	4	5
	First aid injury (e.g., minor cuts and bruises, eye irritation from dust) or very minor health effect	Minor (2)	2	2	4	6	8	10
	Lost Time/ Non-Lost Time injury (e.g., sprains, fracture, cut, lacerations, burns or bruises) or health effect (i.e., deafness or dermatitis) LTI < 5 days	Moderate (3)	3	3	6	9	12	15
	Major injuries: amputations, major fractures, multiple injuries, or irreversible health effects or disabling LTI > 5 days.	Serious (4)	4	4	8	12	16	20
	Multiple fatalities, Life shortening illness and permanent disabilities	Catastrophic (5)	5	5	10	15	20	25

Color coding			
Color	Risk	Score	Risk Management Response
Green	Low	1--6	Risks that are below the risk acceptance threshold and do not require active management. The activity may proceed with normal supervision after implementing the control measures.
Blue	Medium	8--10	Risk that lies on the risk acceptance threshold and require active monitoring. The implementation of additional measures could be used to reduce the risk further.
Yellow	Warning	12--15	Risks that exceed the risk acceptance threshold and require proactive management. Includes risks for which proactive actions have been taken, but further risk reduction is impracticable. Active monitoring is required and the latter requires sign off from senior management.

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Red	High	16--25	Risks that significantly exceed the risk acceptance threshold and need urgent and immediate attention. The activity must not proceed. Alternate controls put in place to reduce the risk to Low or Medium
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Activity	Hazards Involved	Risk to What	Initial Risk Ratings Likelihood x Severity	Fatality Risk?	Maximum foreseeable loss justification	Priority	Prevention/Control Measures	Residual Risk Ratings Likelihood x Severity	Residual foreseeable loss justification	Priority	Responsibility
Unskilled, incompetent, un-inducted persons starting the job or unauthorized person/s entering the work area.	Relevant to all activities. Hazards relating to unskilled, un-inducted persons include all hazards identified in this risk register. Potential that incompetent personnel may be allowed to do a high-risk activity potentially resulting in harm to themselves or others.	People / Equipment	5 x 5 =25	Multiple	Unskilled or un-inducted persons increase the likelihood of another hazard occurring.	High	• Ensure that all personnel prior to starting have completed the induction training and orientation focusing on the hazards associated with the job site and the work to be carried out as per the induction process. • Ensure competency of personnel and adequate supervision as per “PR04: Personnel Competency and Training” and “PR05: Short Service Worker (SSW) Processes”. • SSW personnel shall be mentored and supervised as per SSW Process. • An adequate ratio of SSW/Mentor as per the risk of the task shall be maintained. • Personnel shall not be considered competent and allowed to work until they have graduated as per SSW assessment. • A Toolbox Talk shall be completed before commencement of work.	3 x 5 =15	Potential remains for someone to enter the work area where they can be exposed to the hazards associated with the work.	Warning	Site Supervisor, Engineer, CM

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Risk Register

							• Only people who have signed on to the risk assessment are permitted in the work area. • All access to areas where work is to take place is to be controlled and only permitted following approval. • A Barricading and Signage standard operating procedure (here to “SOP05: Barricading and Signage”) that provides for the establishment of barricading and signage to restrict entry of persons to an area and/or prevent personnel from being exposed to hazards. The SOP is to be developed to meet legal requirements and recognized standards. The SOP will cover but not be limited to: ○ Training and competency required to determine when to use barricading and/or signage and how to establish it such that it ensures that workers and the community are not exposed to hazards. ○ Pre-barricade installation hazard inspection.				
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							○ Selection and installation of a barricade, demarcation and/or signage to establish where the areas that could expose workers or the community to hazards, where higher level controls are not possible or practical. ○ Appropriate safe illumination of barricading and signage of the “at risk” area/s. ○ Signage requirements. ○ Barricading notification protocols. ○ Inspection program. ○ Process for removal of barricading, demarcation and/or signage if the hazard is no longer present. ● Unskilled and/or un-inducted workers shall be kept away via supervision until trained & inducted. Where unskilled and/or uninducted workers need to access the site, they must be accompanied by an inducted and competent person. ● Community shall be informed to stay away from the construction site. ● Signboards shall be displayed to alert public				
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Risk Register

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							about hazards in working area. ● Watchman shall be deployed to prevent entry into working site.				
Driving	● Driver Fatigue ● Speeding ● Lack of situational awareness, Difficult Terrain, community interaction ● Distracted driving ● Weather	People / Equipment	5 x 5 =25	Multiple	Multiple fatality potential due to all forms of vehicle accidents where other vehicles, people or passengers are involved.	High	● Implement the Driving SOPs fatigue related controls (Work schedule, and self-assessment and declaration). ● Implement Work Observation Process, Near-miss reporting, Reward Recognition Processes and Disciplinary Processes. ● Avoid night time driving as much as possible, provide Defensive Driving Training. ● Implement Mobile Phone SOP and Observation process. ● Avoid night time and bad weather driving.	3 x 5 =15	Remains potential for multiple fatalities and many of the conditions cannot be easily controlled. For example, other drivers.	Warning	Site Engineer, CM
Permit to Work (PTW) Compliance	Unauthorized work, or a work within effective controls may result in fatal incident	People / Equipment / Community	5 x 5 =25	Multiple	Operating without an approved PTW could potentially result in unauthorized people working on site and fatal risks not being recognized or controls put in place.	High	● Implement PTW Process in conjunction with DHPP and Contractor organization. ● Provide effective training and agree controls.	3 x 5 =15	Potential remains for work to be carried out without a PTW.	Warning	Site Supervisor, Engineer, CM

Work Adjacent to or Over Water	Work adjacent to water body may result in personnel falling in water and risk of drowning. Flash flooding may cause personnel to be in water body.	People	3 x 5 = 15	Multiple	Likely to occur however with controls can be minimized.	Warning	- Follow PPE Process and anyone being near (1 m) or over water body must wear a prescribed life jacket. - Develop a Severe weather standard operating procedure (hereto referred to "Severe Weather SOP") that ensures that to prevent personnel from the risk of being exposed to severe weather. - Update Emergency Response Plan (ERP) to include a rescue Plan for a dropped person into the water body.	2 x 5 = 10	No change to severity but lower likelihood.	Medium	Site Supervisor, Engineer, CM
Mobile Equipment Operation	During mobilization of equipment & materials, injuries can happen when personnel come into contact with vehicles or equipment.	People / Equipment	5 x 5 = 25	Multiple	Heavy Mobile Equipment (HME) and Light Vehicle (LV) interaction resulting in multiple fatalities.	High	- A Mobile Equipment standard operating procedure (here to referred to as "Mobile Equipment SOP") that provides for safe operation of mobile equipment. The SOP is to be developed to meet legal requirements and recognized standards. The SOP will cover but not be limited to: - Training & competency required to operate the mobile equipment to be used and for working around mobile equipment to be used.	3 x 5 = 15	Potential remains for LV and HME interaction with more than one person.	Warning	Site Engineer, CM



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Risk Register

							○ All plant including infrastructure and mobile equipment must have a routine preventative maintenance inspection program based on the original equipment manufacturers (OEM) recommendations and site standards. ○ Pre-use hazard inspection and development of hazard controls. ○ Prestart inspection requirements. ○ Safe operation of mobile equipment protocols including but not limited to maintaining a safe distance from other vehicles/equipment/people, communication protocols to reduce the risk of collision, conditions for approaching the mobile equipment safely, use of horn signals, signal/flagmen protocols, safe park up, breakdown or emergency protocols, towing, and recovery. ○ Mobile equipment design safety standards.				
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							○ Safe traffic design focusing on separating pedestrians from mobile equipment (including but not limited to installation of bunds and berms) and prevention of inadvertent entry. ○ Process for post-work inspection. ● A Safe Driving standard operating procedure (hereto referred to as “Safe Driving SOP”) that provides for safe operation of vehicles. The SOP is to be developed to meet legal requirements and recognized standards. The SOP will cover but not be limited to: ○ Training and competency required to operate the vehicle to be used. Including but not limited to the need to have a valid driving license for operating the mobile equipment to be used for the work, verification operators are competent by their leader and confirmation of competency from their previous employer, the effects of alcohol & drug use,				
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							inappropriate speed driving distractions driving while tired or with a medical condition. ○ All drivers must be medically fit to carry out their work. ○ Managing fatigue and drugs and alcohol impairment. ○ Pre-use hazard inspection and development of hazard controls. ○ Prestart inspection requirements. ○ Procedures for safe operation of vehicles including but not limited to minimizing distractions (e.g., radios and mobile phones), managing speed, use of safety devices (such as flags, seatbelts etc.), right of way, maintaining a safe distance from other vehicles/equipment, operating during adverse weather conditions, reversing protocols, safe park up, towing and recovery protocols, breakdown, incident or emergency protocols and				
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Site: Infra 1

							inspection, servicing and repair. • A Traffic Interface Planning standard operating procedure (hereto referred to as “Traffic Interface Planning SOP”) that provides for controlling vehicular and pedestrian movements to minimize risk to workers and community members. The SOP is to be developed to meet legal requirements and recognized standards. The SOP will cover but not be limited to: ○ Determining the construction sequence of the project; ○ Determining the alignment of access routes for the safe movement of vehicles, equipment and workers (including but not limited to HME, LV and pedestrian separation); ○ Resolving potential internal traffic conflicts; and ○ Training and competency of workers in the implementation of the Traffic Interface Plan. • Barricading and Signage SOP.				
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							• All non-essential workers & unauthorized persons shall remain outside of the equipment's swing radius and the excavation zone. • Installation of hazard lights and reverse alarms in all vehicles and heavy equipment. • Maintenance record to be maintained by drivers/operators. • Inspections. • Driver training. • Placement of signalmen at dangerous curves. • Community shall be informed to stay away from the mobilization route. • Flagman shall be deployed in the area to guide operators while reversing.				
	Mechanical Fault in machine	Equipment	4 x 5 = 20	Multiple	Brakes or steering failure striking people or other mobile equipment.	High	• All plant, including infrastructure and mobile equipment must have a routine preventative maintenance inspection program based on the original equipment manufacturers (OEM) recommendations and site standards. • Inspect the machine before starting work. • Carry out routine brake and steering testing under safe conditions.	2 x 5 = 10	Potential remains for LV and HME interaction with more than one person should the brakes or steering fail	Medium	Operator, Mechanical Dept.

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Risk Register

							Faulty machines must be tagged out and isolated and shall not be allowed to operate until repaired.				
	The machine may cause excessive noise, vibrations (hand arm or whole body), and eyes and lung irritations.	People	3 x 4 = 12	Single	Health impacts from silicosis or exposure to fibrous materials resulting in cancer.	Warning	- Use of safe systems of work. - Machine mechanical maintenance and records. - Routine cab air leak checks. - Dust suppression (e.g. watercarts, sprinklers). - Proper guarding of compressor machine/covering. - Rest Breaks. - Occupational noise monitoring and alert system. - Use of appropriate Personal Protective Equipment (PPE) (e.g. PM2 masks, earmuffs and plugs, safety glasses and goggles, gloves etc.). - Use coveralls that do not retain dust (synthetic rather than cotton). - Protective gloves suitable for working with respirable crystalline silica. - Use a contract laundry or a suitable equivalent to wash work clothing.	2 x 4 = 8	Potential still exists for terminal lung disease from inhaling silica or fibrous materials. In addition, the controls are focused on PPE which rely on user behaviour.	Medium	Site Supervisor, Blasting supervisor, CM
	Dust	People / Community	3 x 4 = 12	Single	Health impacts from silicosis or exposure to	Warning	- Dust suppression (e.g. watercarts, sprinklers etc.). - Use of appropriate PPE (e.g. PM2 masks, safety	2 x 4 = 8	Potential still exists for terminal	Medium	Site Supervisor

					fibrous materials resulting in cancer.		- glasses and goggles, gloves etc.). - Personal dust monitoring and alert system. - Radio communications to reduce the need to exit the cab. - Clean the cab regularly (at least once a week) using vacuum equipment that meets at least the dust Class M classification. - Use coveralls that do not retain dust (synthetic rather than cotton). - Protective gloves suitable for working with respirable crystalline silica. - Use a contract laundry or a suitable equivalent to wash work clothing. - Establish safe working zones and ensure they are clearly defined, and protection barriers are used as needed. Refer to the Barricading and Signage SOP.		lung disease from inhaling silica or fibrous materials. In addition, the controls are focused on PPE which rely on user behaviour.		
	Slips and Trips	People	3 x 4 = 12	Unlikely	Trips and falls are common throughout the construction industry. While most slips and trips result in recoverable fractures,	Warning	- Design work areas to have minimal trip and slip hazards. - Illuminate walkways. - Housekeeping shall be done prior to commencement of work. - Maintain clear walkways (ensure the walkways are free of equipment, tools,	3 x 4 = 12	Unlikely to significantly reduce the likelihood to level 2 ("Possible").	Warning	Site Supervisor

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Risk Register

					sprains and lacerations; major fractures are known to occur and lifelong chronic pain can result.		- construction debris and other materials). - Establish drainage to move water away from walkways and avoid pooling. - Barricading and Signage SOP. - Where work areas are unsafe due to uneven ground the work areas are to be graded. - Use footwear that provides good slip resistance.				
	Hands or clothing getting caught in spinning chuck or drill bit.	People	2 x 4 = 8	Unlikely	Potential for major injury resulting from clothing or body part getting caught in the chuck or drill bit. Amputation or major fracture possible.	Medium	- Ensure equipment is maintained, serviced and in good condition before use. - Ensure that all guards and safety devices are in place for moving and rotating parts. - Keep hands away from bit/chuck. - Drillers are to remove all jewelry and other ornaments, wear coveralls, have no loose clothing and tie-back hair. - Establish safe working zones and ensure they are clearly defined, and protection barriers are used as needed. Refer to the Barricading and Signage SOP. - The certified and competent driller and driller's assistant are the	2 x 4 = 8	Unlikely to bring the likelihood down to 1 ("Remote")	Medium	Site Supervisor

							only two people permitted to be in the work area.				
	Falling of rock by vibration	People/ Equipment	4 x 5 = 20	Multiple	Loose rock striking workers from cliffs and walls resulting in multiple workers being struck (e.g. The driller and driller's assistant) is known to occur in mining and construction related industries.	Warning	• Training and competency required to carry out excavation work. • Pre-excavation Job Hazard Analysis (JHA) including hazard inspection and development of controls. • Inspection of the area to be drilled shall be done prior to start of work for identifying hanging/ loose embedded rock. • Scaling shall be done prior to commencement of drilling activity if required to eliminate rock fall hazard. • Design excavation to allow safe access, work and egress and prevent inadvertent entry. Apply the Barricading and Signage SOP to control access to areas where loose rock exists. • Safe illumination of work areas. • Work notification protocols. • Monitoring and supervision program. • Process for post-work inspection.	2 x 5 = 10	Likelihood relates to a loose rock not being identified during the inspection. No change to outcome.	Medium	Site Supervisor, Site Engineer, CM
	Grazing Animals	Animals	3 x 5 = 15	Multiple	Event involving	Warning	• Safe Driving SOP.	3 x 5 = 10	Controls are unlikely	Warning	Site Supervisor

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Risk Register

					driver avoiding to miss an animal resulting in a fatality and could have killed others.		• Drive to conditions and do not drive over the speed limit. • Push away animals from working site. • Inform the community to keep away their animals from construction site. • Fence off active construction areas to prevent access.		to reduce the likelihood to 2 ("Possible") because they are largely behavioral.		
	Dehydration while working in hot weather	People	2 x 4 = 8	Single	Dehydration resulting in heat stroke is a known cause of death in the construction industry.	Medium	• Modify work schedules and activities to avoid sun exposure when doing physically demanding tasks. • Mandatory rest breaks in a cooler environment (such as a shaded location). • Duration of the rest breaks should increase as heat stress rises. • Drink Approx. 250ml of water every 15-20 min. • Drink at short intervals rather than large amounts infrequently. • Don't drink more than 1.5 liters. of water per hour. • Provide sufficient shaded shelter areas for workers cool down.	2 x 4 = 8	Controls are behavioral based and potentially not complied with.	Medium	Site Supervisor, CM
	Cold weather	People	3x3=9	Single	Unlikely that without controls someone would pass	Medium	• Warm clothing shall be worn while working in cold weather.	1x3=3	Unlikely that without controls someone	Low	Site Supervisor, CM

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Site: Infra 1

Risk Register

					away from the cold.				would pass away from the cold.		
	Fault in drill machine	People/ Equipment	3 x 4 = 12	Single	Faulty electrics could cause electrocution. Possibly resulting in a fatality. Likely to be one person exposed only.	Warning	• All plant including infrastructure and mobile equipment must have a routine preventative maintenance inspection program based on the original equipment manufacturers (OEM) recommendations and site standards. • Inspect the machine prior to commencement of drilling activity. • If defects are identified the machine is to be isolated tagged out shall not be used until repaired. • Electrical system shall be properly grounded. • ELCB or RCD circuit breaker shall be installed. These breakers will trip automatically in case of current leakage or overload. • Combustibles shall be removed. • Electrical grounding shall be ensured. • Earth leakage circuit breaker shall be installed. • Cables shall be arranged properly to prevent damage.	2 x 4 = 8	Controls rely on behavior. Potential controls are not effectively put in place.	Medium	Driller, drilling Supervisor, CM



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Site: Infra 1

							• Periodic electrical inspection shall be conducted.				
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	Working at height (falling from one level to another). Also includes falling down slopes and risk of being struck by dropped objects.	People	$4 \times 4 = 16$	Single (multiple could occur but unlikely)	Working at Height Fatalities is one of the more likely constructions related events. <u>In Australia it represents 11% of all work-related deaths.</u>	High	- A Working at Height standard operating procedure (hereto referred to as "Working at Height SOP") that provides for safe work when there is a risk of falling or being struck by falling objects. The SOP is to be developed to meet legal requirements and recognized standards. The SOP will cover but not be limited to: - Training and competency required to carry out work at height and/or where there is potential for dropped objects (this includes but is not limited to the risk of objects falling into an excavation). - Pre-task JHA including hazard inspection as a minimum focusing on any hazard that exposes a person to the potential to fall and the potential for objects to fall. - Development of controls applying the following in order of decreasing effectiveness: eliminate the risk of a fall and dropped objects; prevent the	$3 \times 4 = 12$	Behavioral based controls	Warning	Site Supervisor CM
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Site: Infra 1

Risk Register

							fall by working on solid construction (for example the use of hard barricades); and minimize the risk of a fall by providing and maintaining a safe system of work through the use of Personal Fall Protection (PFP). ○ Specific controls could include but limited to signage and barriers extending past the drop zone, establishment of safe walkways, securely covering open voids with rigid material or provided with guard rails, scaffolding with kickboards, elevated work platforms (EWPs), standby-safety watch, equipment lanyards, bags, handline or hoist, buoyancy devices (where working on, over or near water). ○ Design of work area to prevent inadvertent entry. ○ Safe lighting of the work area. ○ Work notification protocols. ● Barricading and Signage SOP.				
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[illegible]

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Risk Register



Blasting	Uncontrolled release of chemical energy resulting in projectiles (e.g., fly rock), ground vibration, air overpressure, noise and dust	People/ Equipment/ Buildings	4 x 5 = 20	Multiple	With no access controls and no blasting design an incident involving multiple fatalities is likely.	High	- Explosives – Storage, Transport and Use standard operating procedure (here to referred to as “Explosives SOP”) that provides for safe transportation, storage, transfer, blasting and recycling activities. The SOP is to be developed to meet legal requirements and recognized standards. The SOP will cover but not be limited to: - Training and competency required to carry out blasting work; - Blast area inspection (including areas surrounding the construction area such as residences, roads, public places, dangerous goods storage etc.); - Blast design involving establishment of holes that reduce the risk of producing flyrock (depth, burden depth, stemming, shots from the face back etc.); - Blast exclusion zone and guarding and barricading for blasts; - Blast exclusion zone sentries to prevent unauthorized access;	3 x 5 = 15	No change to severity. Likelihood at 3 due to controls being behavioral	Warning	Site Supervisor, CM
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							○ Blast notification protocols (including alarm systems); ○ Monitoring program; ○ Design of explosive storage facility; ○ Handling and transport of explosives; ○ Process for post-blast inspection and responding to misfires; and ○ Explosive material disposal. ● Drilling and Blasting SOP. ● Barricading and Signage SOP.				
	Premature blast	People	3 x 5 = 15	Multiple	Detonation of an explosive charge earlier than warranted possibly due to carelessness, accidental percussion, a faulty fuse or degenerated explosives.	Warning	● Explosives SOP. ● Drilling and Blasting SOP. ● Establishment of a blast exclusion zone. Refer to Barricading and Signage SOP. ● Mobile vehicle access to the shot should be via clearly defined access routes and a spotter should be used to control vehicle movements in areas of restricted visibility. ● Never drill in a previously drilled hole. ● Do not drill holes where there is danger of intersecting a charged or misfired hole.	3 x 5 = 15	No change to severity. Likelihood at 3 due to controls being behavioral.	Warning	Site Supervisor, CM

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Risk Register

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							- Free flowing or friction/impact sensitive explosives should not be opened or left in the magazine in a condition that could instigate premature ignition. - Only suitable tools appropriate for the opening of explosives shall be used to open packages. - Training and awareness of blast crew on causes of premature blasts. - For holes at risk of reaching temperatures identified by the manufacturer as being high risk of premature detonation develop and implement controls based on the manufacturer's guidance and recognized standards.				
	Use of electronic devices (radio sets, mobile phones, cameras) during charging can trigger the detonators	People	3 x 5 = 15	Multiple	Electronic equipment is known to trigger detonators if used in close proximity.	Warning	- Cordon off the charging area to exclude people from entering the area with an electronic device. Refer to the Barricading and Signage SOP. - Provide blast shelters for protection of the blast crew. - All electronic devices shall be kept off while entering 100mtr radius of the charging area. Strict supervision shall be done to ensure the compliance.	2 x 5 = 10	Outcome will not change if a detonator is triggered but lower likelihood	Medium	Site Supervisor, CM

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Risk Register

							• Training and awareness of blast crew on causes of premature blasts.				
	Undetonated explosives	People	3 x 5 = 15	Multiple	Drilling into a previously drilled hole or running over an undetonated explosive resulting in a fatality. Significant event has occurred where a worker was hit during disposal of explosive materials.	Warning	• Explosives SOP. • Drilling and Blasting SOP. • Cordon off the charging area to keep numbers of people to a minimum. Refer to the Barricading and Signage SOP. • Provide blast shelters for protection of the blast crew. • Never drill in a previously drilled hole. • Do not drill holes where there is danger of intersecting a charged or misfired hole. • Training and awareness of blast crew on causes of premature blasts.	3 x 5 = 15	Relies on behavioral controls	Warning	
	Severe Weather	People	2 x 5 = 10	Multiple	Unlikely for multiple fatalities occurring from a lightning event setting off an explosive.	Warning	• Severe Weather standard operating procedure (Severe Weather SOP) covering but not limited to controlling the risk of unintended ignition of explosives due to lightning and the deterioration of explosives from being exposed to water resulting in misfires. SOP to include a TARP (Trigger, Action, Response Plan) for responding to conditions	2 x 5 = 10	Likelihood reduced because work is unlikely to take place during a thunderstorm	Medium	Site Supervisor, CM



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							where lightning strike is possible. • Must stop the charging in cloudy whether as its more likely that detonators can get detonated in such weather during electric blasting. • Fire explosives at the earliest practicable and safe time.				
	Dust	People	3 x 4 = 12	Single	Health impacts from silicosis or exposure to fibrous materials resulting in cancer	Warning	• Apply the same controls as for Drilling Dust above.	2 x 4 = 8	Potential still exists for terminal lung disease from inhaling silica or fibrous materials. In addition, the controls are focused on PPE which are behavioral.	Medium	Site Supervisor



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	Inadequate Blast Security	People	4 x 5 = 20	Multiple	Uncontrolled access to a blast pattern is highly likely to result in fatalities	High	- Explosives SOP. - Drilling and Blasting SOP. - Barricading and Signage SOP. - Establish cordons to prevent accessing areas within the blast zone and commission sentries at each of the access points to the blast zone. - Establish alarm alert system for carrying out blasts. - Community shall be informed to stay away from the construction site. - Signboards shall be displayed to alert public about hazards in working area. - Watchman shall be deployed to prevent unauthorized entry into working site.	3 x 5 = 15	No change to severity. Likelihood at 3 due to controls being behavioral	Warning	Site Supervisor, CM
Excavation Work	Untrained Operator	People/ Equipment	5 x 5 = 25	Multiple	Unskilled or un-inducted persons increase the likelihood of another hazard occurring.	High	- An Excavation standard operating procedure (hereto referred to as "Excavation SOP") that provides for safe excavation work. The SOP is to be developed to meet legal requirements and recognized standards. The SOP will cover but not be limited to: - Training and competency required	2 x 5 = 10	Potential remains for someone to enter the work area without the experience to understand the risks and controls.	Medium	Supervisor, Site Engineer, CM

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							- to carry out excavation work. ○ Pre-excavation JHA including hazard inspection and development of controls¹. ○ Design of excavation to allow safe access, work and egress and prevent inadvertent entry. ○ Safe illumination of the excavation area. ○ Excavation notification protocols. ○ Monitoring and supervision program. ○ Process for post-excavation inspection. ● Barricading and Signage SOP. ● Signboards shall be displayed to alert public about hazards in working area. ● Flagmen shall be deployed & strict supervision shall be ensured to prevent public entry into working radius of heavy equipment. ● Include controls for “Unskilled, un-inducted persons starting the job				
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¹ Hazards that should be controlled should include but not be limited to: untrained operator, struck by, confined space and cave-in, inappropriate placement of excavated materials, plant or other loads affecting the structural integrity or slipping into the excavation, public utility, dust, rockfall, land sliding, slip and trip, working at height, falling objects, fall from slopes, loose materials, instability of adjoining structures, presence of or possible in-rush of water or other liquid, traffic, grazing animals, rain, entrance of un-authorized person in working area, dehydration, cold weather, fault in machine.

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							or unauthorized person/s entering the work area”.				
	Struck by Mobile Equipment	People	4 x 5 = 20	Multiple	In absence of controls the likelihood of a piece of heavy mobile equipment striking another light vehicle. could occur once or twice per year.	High	● Excavation SOP. ● Mobile Equipment SOP. ● Safe Driving SOP. ● Traffic Interface Planning SOP. ● Barricading and Signage SOP. ● All non-essential workers shall remain outside of the equipment's swing radius and the excavation zone. ● Workers shall be trained to keep a distance from working radius of equipment. ● Signboards shall be displayed to alert public about hazards in working area. ● Flagmen shall be deployed & strict supervision shall be ensured to prevent public entry into working radius of heavy equipment. ● Include controls for “Unskilled, un-inducted persons starting the job or unauthorized person/s entering the work area”. ● Take all reasonable steps to ensure that all safety features, warning devices, guarding, operational controls, emergency stops are used in accordance with instructions and	3 x 5 = 15	Potential remains for a light vehicle to enter the work area and be hit by a piece of heavy mobile equipment. No change to consequence.	Warning	Supervisor, Site Engineer, OHS Supervisor, CM

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							information provided to the worker. • Mechanical plant, vehicles and storage of materials including excavated material or other heavy loads should not be located in the 'zone of influence' of an excavation unless the ground support system installed has been designed by a competent person, for example a geotechnical engineer, to carry such loads.				
	Confined Space and Cave In	People	3 x 5 = 15	Multiple	A wall failure resulting in multiple workers being engulfed is known to occur in mining and construction related industries. There is unlikely to be many examples of confined spaces where workers could potentially be asphyxiated.	Warning	• Excavation SOP • In areas where cave-ins are possible, before entering the work area for the first time they are to be inspected by a geotechnical engineer who will inspect and ensure that the work areas are safe. Where this isn't the case, no one is to enter the risk areas until they have been made safe. • All excavations shall be properly sloped, benched, shored or shielded. • Shoring and compaction of slope will be carried out in the presence of competent Geotechnical Engineer. • Large earthmoving machinery, for example bulldozers should not	2 x 5 = 10	With the controls in place the likelihood of a wall failure resulting multiple fatalities is decreased.	Medium	Supervisor, Site Engineer, CM

							operate close to an overhang or a deep excavation as the weight may collapse the sides. - Equipment should always approach embankments or trenches from across the line of a trench rather than parallel to it. - Routine periodic inspections must be done for identification and subsequent removal of loose rocks.				
	Inappropriate Placement of Excavated Materials, plant or other loads affecting the structural integrity or slipping into the excavation	People	3 x 5 = 15	Multiple	Any material will add a load to the area where it is placed affecting the stability of the excavation.	Warning	- Excavation SOP. - Mechanical plant, vehicles and storage of materials including excavated material or other heavy loads should not be located in the 'zone of influence' of an excavation unless the ground support system installed has been designed by a competent person, for example a geotechnical engineer, to carry such loads. - While developing the plan for the work, ensure that the location where materials are to be placed or stacked is not near the edge of the excavation and that there is adequate setback from the zone of influence to avoid the risk of failure into the excavation.	2 x 5 = 10	With the controls in place the likelihood of excavated materials overloading the wall of the excavation or falling into it is decreased.	Medium	Supervisor, Site Engineer, CM

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	Public Utility (e.g. water, sewerage, telecommunications, electricity etc.)	People/ Equipment	4 x 5 = 20	Multiple	Excavation works striking public utilities either overhead or underground are common in the construction industry. As such there is a risk of multiple fatalities from this scenario.	High	- Utilities shall be protected, supported or removed after getting consent of the engineer before work. - Excavation SOP - For underground assets - Identify all assets within the construction footprint; - Contact local service providers to confirm presence and alignment; - Use a qualified cable locating service provider; - Determine the minimum approach distances from industry regulations, codes of practice and guidelines; - Determine the collapsible area of the proposed excavation; - Protect the assets and colleagues using barriers around the excavation site and work area; - Pothole by hand or other non-destructive means to removal small amounts of soil to provide the location and depth of underground services; and	2 x 5 = 10	No change to severity. Likelihood will decrease as services are avoided by adopting these controls	Medium	Supervisor, Site Engineer, CM
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							○ Only use mechanical excavation after all services have been identified, exposed and protected. ● For overhead assets ○ Know the location and voltages of network assets in the work area and determine required clearances; ○ Check heights of loads compared with overhead network assets; ○ Determine the extension, reach and height of equipment; ○ Ensure that all works are out of the danger zone from electrical assets; ○ Do not lift loads under powerlines; and ○ Establish laydown areas and store equipment and plant away from power assets.				
	Dust	People / Community	3 x 4 = 12	Single	Health impacts from silicosis or exposure to fibrous materials resulting in cancer. Note, there may be exposure of	Warning	● Excavation SOP. ● Apply dust suppression and exclusion controls as per "Drilling Dust" above. ● Sprinkling must be done to control dust on a regular basis.	2 x 4 = 8	Potential still exists for terminal lung disease from inhaling silica or fibrous	Medium	Supervisor, Site Engineer, CM

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					more than one person.				materials. In addition, the controls are focused on PPE.		
	Rock Fall / Loose Materials	People/ Equipment	4 x 5 = 20	Multiple	Loose rock striking workers from cliffs and walls resulting in multiple workers being struck (e.g. in a light vehicle) is known to occur in mining and construction related industries.	High	- Excavation SOP. - Inspection of the area to be drilled shall be done prior to start of work for identifying hanging/ loose embedded rock. - Apply the Barricading and Signage SOP to control access to areas where loose rock exists. - All excavations shall be properly sloped, benched, shored or shielded. - Shoring and compaction of slope will be carried out in the presence of competent Geotechnical Engineer. - Scaling shall be done prior to commencement of drilling activity if required to eliminate rock fall hazard. - Large earthmoving machinery, for example bulldozers should not operate close to an overhang or a deep excavation as the weight may collapse the sides. - Equipment should always approach embankments or trenches from across	3 x 5 = 15	Likelihood relates to a loose rock not being identified during the inspection. No change to outcome.	Warning	Supervisor, Site Engineer, HSE Department, CM



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							- the line of a trench rather than parallel to it. - Routine periodic Inspection must be done for identification and subsequent removal of loose rocks. - Signboards shall be installed to alert the commuters.				
	Land Sliding	People/Equipment	3 x 5 = 15	Multiple	A landslide resulting in multiple workers being engulfed is known to occur in mining and construction related industries.	Warning	- Excavation SOP. - In areas where landslides are possible, before entering the work area for the first time they are to be inspected by a geotechnical engineer who will inspect and ensure that the work areas are safe. Where this isn't the case, no one is to enter the risk areas until they have been made safe. - Observe and monitor sliding area. - Restrict entry into high risk sliding areas until slope stability work is done.	2 x 5 = 10	With the controls in place the likelihood of a landslide resulting multiple fatalities is decreased.	Medium	Supervisor, Site Engineer, CM
	Slips and Trips	People	3 x 4 = 12	Unlikely	Trips and falls are common throughout the construction industry. While most slips and trips result in recoverable fractures,	Warning	- Excavation SOP - Barricading and Signage SOP - Implement controls from "Mobile Equipment - Drilling Trips & Slips" above.	3 x 4 = 12	Unlikely to significantly reduce the likelihood to level 2 ("Possible").	Warning	Supervisor, Site Engineer, CM

					sprains and lacerations major fractures are known to occur and lifelong chronic pain can result.						
	Working at height (falling from one level to another). Also includes falling down slopes and risk of being struck by dropped objects.	People	$4 \times 4 = 16$	Single (multiple could occur but unlikely)	Working at Height Fatalities is one of the more likely constructions related events.	High	- Working at Height SOP - Controls shown in the "Drilling Working at height (falling from one level to another) and dropped objects" above.	$3 \times 4 = 12$	Behavioral based controls	Warning	Supervisor, Site Engineer, CM
	Instability of Adjoining Structures caused by the excavation	People / Structures / Community	$2 \times 5 = 10$	Multiple	Excavation work may seriously affect the security or stability of part of a structure at or adjacent to the location of the proposed excavation, which can lead to structural failure or collapse.	Medium	- Excavation work must not start until steps are taken to prevent the collapse or partial collapse of potentially affected buildings or structures. - Excavation below the level of the footing of a structure, including retaining walls, that could affect the stability of the structure will be assessed by a structural/civil engineer and secured by a ground support system which has been designed by a competent person.	$2 \times 5 = 10$	Unlikely that these controls will reduce the likelihood to "Remote".	Medium	Supervisor, Site Engineer, CM

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							● Routine inspections of the buildings and structures at risk of failure from the excavation works will be carried out by a competent person to monitor for stability issues.				
	Presence of or Possible In-Rush of Water or Other Liquid	People	3 x 5 = 15	Multiple	An inrush of water into the excavation resulting in multiple workers being engulfed is known to occur in mining and construction related industries. There is unlikely to be many examples of in-rush where workers could potentially drown.	Warning	● Excavation SOP. ● The catchment of the work area is to be inspected by a civil engineer who will inspect and ensure that the drainage diverts surface waters away from the excavation and that diversion structures are designed to manage floodwaters. Where this isn't the case, drainage will be designed to control the risk of in-rush. ● As required, ensure that adequate sump-pump systems are available to manage groundwater inflow as needed. ● Routine, periodic inspections must be done to assess the integrity of diversion structures, pit sump and pumping capacity and to identify potential hazards not already identified or known hazards with an increased likelihood of	2 x 5 = 10	With the controls in place the likelihood of a wall failure resulting multiple fatalities is decreased.	Medium	Supervisor, Site Engineer, CM

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							causing in-rush. This is to also occur after significant rainfall events.				
	Traffic	People/ Equipment	5 x 5 = 25	Multiple	HME and LV interaction resulting in multiple fatalities.	High	• Mobile Equipment SOP. • Safe Driving SOP. • Traffic Interface Planning SOP. • Barricading and Signage SOP. • Controls outlined in “Mobile Equipment Operation During mobilization of equipment and materials injuries can happen when personnel come into contact with vehicles or equipment” above. • Provide separate access for light vehicles and separate access for heavy mobile equipment. Access routes for heavy mobile equipment are to be lined by bunds at least half the height of the largest wheel of the equipment being used. • Provide separate walking access where the risk of interactions with mobile equipment is low. • Provide designated heavy mobile equipment park up and separate designated light vehicle park up. • Temporary haul roads should be well constructed and	3 x 5 = 15	Remains potential for LV and HME interaction with more than one person	Warning	Supervisor, Site Engineer, CM

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							maintained to enable plant operators to complete the work safely.				
							- Follow Traffic Rules - Implement approved traffic management Plan properly. - Deploy Flagman to control traffic.				
	Grazing Animals	Animals	3 x 5 = 15	Multiple	Event involving driver avoiding to miss an animal resulting in a fatality and could have killed others.	Warning	- Safe Driving SOP. - Drive to conditions and do not drive over the speed limit. - Push away animals from working site. - Inform the community to keep away their animals from construction site. - Fence off active construction areas to prevent access.	3 x 5 = 10	Controls are unlikely to reduce the likelihood to 2 ("Possible") because they are largely behavioral.	Medium	Site Supervisor
	Severe Weather	People	2 x 5 = 10	Multiple	Unlikely for multiple fatalities occurring from a lightning event setting off an explosive.	Warning	Severe Weather standard operating procedure (Severe Weather SOP) covering but not limited to controlling the risk of lightning strike. SOP to include a TARP (Trigger, Action, Response Plan) for responding to conditions where lightning strike is possible.	2 x 5 = 10	Likelihood reduced because work is unlikely to take place during a thunderstorm	Medium	Site Supervisor, CM
	Dehydration while working in hot weather	People	2 x 4 = 8	Single	Dehydration resulting in heat stroke is a known cause of death in the	Medium	Implement controls shown in "Mobile Equipment Operation - Dehydration while working in hot weather" above.	2 x 4 = 8	Controls are behavioral based and potentially not	Medium	Site Supervisor, CM

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					construction industry.		• Drink Approx. 250 ml of water every 15-20 min. • Drink at short intervals rather than large amounts infrequently. • Don't drink more than 1.5 litres. per hour. • Provide sufficient shaded areas for workers cool down.		complied with.		
	Cold weather	People	2x4 = 8	Single	Unlikely that without controls someone would pass away from the cold.	Medium	• Warm clothing shall be worn while working in cold weather.	1x4 = 4	Unlikely that without controls someone would pass away from the cold.	Low	Site Supervisor, CM
	Fault in machine	People/ Equipment	2 x 4 = 8	Single	Faulty electrics could cause electrocution. Possibly resulting in a fatality.	Medium	• Implement controls from "Drilling – Fault in drill machines" provided above. • Preventive maintenance shall be done well in time to prevent faults in machines.	2 x 4 = 8	Controls rely on behavior. Potential controls are not effectively put in place.	Medium	Site Supervisor, CM
	Dust	People/ Environment	3 x 4 = 12	Single	Health impacts from silicosis or exposure to fibrous materials resulting in cancer	Warning	• Apply the same controls as for "Drilling Dust" above.	2 x 4 = 8	Potential still exists for terminal lung disease from inhaling silica or fibrous materials.	Medium	Site Supervisor

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									In addition, the controls are focused on PPE.		
	Slips and Trips	People	3 x 4 = 12	Unlikely	Trips and falls are common throughout the construction industry. While most slips and trips result in recoverable fractures, sprains and lacerations major fractures are known to occur and lifelong chronic pain can result.	Warning	- Excavation SOP. - Implement controls from "Drilling Trips & Slips" above. - Barricading and Signage SOP.	3 x 4 = 12	Unlikely to significantly reduce the likelihood to level 2 ("Possible").	Warning	Supervisor, Site Engineer, CM
	Improper road gradient	People/ Equipment / Community	4x5 = 20	Multiple	Road accidents involving vehicles rolling off improper road gradients.	High	- Road shall be properly maintained. - Gradient shall be proper. - Parapet Walls shall be constructed at earliest at high gradient narrow areas.	3 x 5 = 15	Likelihood should decrease but no impact on severity	Warning	Supervisor, Site Engineer, CM
Spoil Haulage	Over Speed	People/ Equipment	4 x 5 = 20	Multiple	Speed related road accidents are common. Potential for LVs to have	High	- Traffic Interface Planning SOP. - Safe Driving SOP - Speed Limits shall be followed as per submitted traffic management plan.	3 x 5 = 15	Still at risk of behavioral lapses	Warning	Supervisor, Site Engineer, HSE

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					more than person in a speeding car.		• Road bumps shall be constructed to control speed limits. • Signboards shall be installed displaying speed limit. • Defensive driving sessions shall be conducted especially for heavy equipment drivers.				Department, CM
	High noise level	People	3 x 4 = 12	No	Permanent hearing loss is common in the construction industry.	Warning	• Regular maintenance & repair of machines shall be done. • Use hearing protection when exposed to excessive noise levels (greater than 85 dB over an 8-hour work period). • Machine mechanical maintenance and record. • Occupational noise monitoring and alert system. • Use of appropriate PPE (e.g. earmuffs and plugs).	3 x 4 = 12	Unlikely to drop the risk to Possible due to order of magnitude.	Warning	Supervisor, Site Engineer, CM
	Psychological Stress	People	5 x 4 = 20	Single	Work related stress can lead to extensive lost time or loss of life.	High	• Rest breaks shall be given to workforce after different intervals. • Workload shall be distributed among workforce equally.	5 x 4 = 20	Controls won't change this.	High	Supervisor, Site Engineer, CM
Traffic Management	Pedestrians	People	3 x 5 = 15	Multiple	Less likely to result in multiple fatalities than the likelihood for HME and LV	Warning	• Mobile Equipment SOP. • Safe Driving SOP. • Traffic Interface Planning SOP. • Barricading and Signage SOP	2 x 5 = 10	The controls proposed would not significantly reduce	Medium	Supervisor, Site Engineer, CM

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					interaction. However, it could be possible for a truck to hit multiple bystanders.		• Don't allow pedestrians to stay in working zone. • Trained flagmen shall be deployed for the above-mentioned purpose. • Provide information on traffic movements when using public roads to key community representatives for dissemination. • All additional controls provided in "Mobile Equipment Operation - During mobilization of equipment and materials injuries can happen when personnel come into contact with vehicles or equipment" above.		the Likelihood.		
	Traffic movement	People/ Equipment	5 x 5 = 25	Multiple	HME and LV interaction resulting in multiple fatalities.	High	• Mobile Equipment SOP. • Safe Driving SOP. • Traffic Interface Planning SOP. • Barricading and Signage SOP. • All controls recommended in "Mobile Equipment Operation - During mobilization of equipment and materials injuries can happen when personnel come into contact with vehicles or equipment." provided above.	3 x 5 = 15	Remains potential for LV and HME interaction with more than one person.	Warning	Drivers, CM
	Over Speed	People/ Equipment	4 x 5 = 20	Multiple	Speed related road accidents are common.	High	• Traffic Interface Planning SOP. • Safe Driving SOP.	3 x 5 = 15	Still at risk of behavioral	Warning	Supervisor, Site Engineer,

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							• Speed Limits shall be followed as per submitted traffic management plan. • Road bumps shall be constructed to control speed limits. • Signboards shall be installed displaying speed limit. • Defensive driving sessions shall be conducted especially for heavy equipment drivers.		lapses and having multiple people in an L.V.		HSE Department, CM
	Unawareness about traffic rules.	People	5 x 5 = 25	Multiple	HME and LV interaction resulting in multiple fatalities.	High	• Mobile Equipment SOP. • Safe Driving SOP. • Traffic Interface Planning SOP. • Barricading and Signage SOP. • All controls recommended in “Mobile Equipment Operation - During mobilization of equipment and materials injuries can happen when personnel come into contact with vehicles or equipment.” provided above. • Orientate the flagman and staff about traffic rules through training sessions. • Signboards containing traffic rules shall be displayed at site for community awareness.	3 x 5 = 15	Remains potential for LV and HME interaction with more than one person	Warning	HSE dept., CM



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Concrete Manufacturing	Eye, skin & respiratory tract irritation	People	3 x 4 = 12	Single	Lime from cement can cause caustic injuries to eyes, skin and the respiratory system. Health impacts from silicosis linked to premature death.	Warning	● Batching operation shall be done from operating cabin to avoid dust exposure. ● Enclosed ventilated cab fitted with air intakes. Ensure that the door and windows are closed at all times. ● Wear alkali-resistant gloves, coveralls. ● Waterproof boots and eye protection. ● Routine cab air leak checks. ● Dust suppression (e.g. watercarts, sprinklers). ● Safety goggles shall be worn. ● Wear N-, P- or R-95 respirators to minimize inhalation of cement dust ● Personal dust monitoring and alert system. ● Radio communications to reduce the need to exit the cab. ● Personal dust monitoring and alert system. ● Clean the cab regularly (at least once a week) using vacuum equipment that meets at least the dust Class M classification. ● Use coveralls that do not retain dust (synthetic rather than cotton). ● Protective gloves suitable for working with	2 x 4 = 8	Potential still exists for terminal lung disease from inhaling silica or fibrous materials. In addition, the controls are focused on PPE.	Medium	Batching Plant Supervisor
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							respirable crystalline silica. • Use a contract laundry or a suitable equivalent to wash work clothing. • Establish safe working zones and ensure they are clearly defined, and protection barriers are used as needed. Refer to the Barricading and Signage SOP.				
	Lack of guards or Inadequate Safety guards	People	5x5 = 25	Multiple	Guards are in place to prevent exposure of workers to damaging energies. In absence of these controls there is potential for multiple fatalities.	High	• All plant including infrastructure and mobile equipment must have a routine preventative maintenance inspection program based on the original equipment manufacturers (OEM) recommendations and site standards. • Prestart inspection requirements. • Maintain conveyor belt systems to avoid jamming and use care in clearing jams. • Ensure that guards are in place to protect workers. • Establish and follow effective lockout/tagout procedures when servicing equipment.	3 x 5 = 15	Guards are maintained by administrative controls dropping the likelihood, but the severity does not change.	Warning	Batching Plant Supervisor
	Inadequate lockout/tagout systems	People	5x5 = 25	Multiple	Testing and tagging prevent the potential for energy to be released from	High	• Establish & follow effective lockout/tagout procedures when servicing equipment that meet internationally recognized standard.	3 x 5 = 15	No change to severity but reducing this likelihood	Warning	Batching Plant Supervisor

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					unsafe systems. These controls can be used for hazards that pose risks to multiple fatalities.		• Training and competency for workers.		by the use of an administrative control.		
	Over exertion/Body stressing	People	5x3 = 15	Unlikely	Musculoskeletal events in construction are the most common events in the industry.	Warning	• Avoid working in awkward postures. • Use ladders. • Utilize Mechanical aids. • Training and competency for manual handling and ergonomics.	4x3 = 12	Not going to reduce the likelihood of a level 3 event.	Warning	Batching Plant Supervisor
	Slips and Trips	People	3 x 4 = 12	Unlikely	Trips and falls are common throughout the construction industry. While most slips and trips result in recoverable fractures, sprains and lacerations major fractures are known to occur and lifelong chronic pain can result.	Warning	• Design work areas to have minimal trip and slip hazards. • Establish drainage to move water away from walkways and avoid pooling. • Illuminate walkways. • Housekeeping shall be done prior to commencement of work. • Maintain clear walkways (ensure the walkways are free of equipment, tools, construction debris and other materials). • Barricading and Signage SOP. • Where work areas are unsafe due to uneven ground the work areas are to be graded.	3 x 4 = 12	Unlikely to significantly reduce the likelihood to level 2 ("Possible").	Warning	Batching Plant Supervisor

							Use footwear that provides good slip resistance.				
	Working at Height (falling from one level to another). Also includes risk of being struck by dropped objects.	People	$4 \times 4 = 16$	Single (multiple could occur but unlikely)	Working at Height Fatalities is one of the more likely constructions related events.	High	- Working at Height SOP. - Avoid working beneath conveyor belts & heightened platforms. - Stack and store materials properly to limit the risk of falling objects. - Clear walkways, work areas of equipment, tools, construction debris and other materials.	$3 \times 4 = 12$	Behavioral based controls	Warning	Batching Plant Supervisor
	Electrical	People/ Equipment	$3 \times 5 = 15$	Multiple	Faulty electrics could cause electrocution. Possibly resulting in a fatality.	Warning	- All plant including infrastructure and mobile equipment must have a routine preventative maintenance inspection program based on the original equipment manufacturers (OEM) recommendations and site standards. - Implement controls from "Drilling – Fault in drill	$2 \times 5 = 10$	Controls rely on behavior. Potential controls are not effectively put in place.	Medium	Batching Plant Supervisor

							machines” provided above. • Preventive maintenance shall be done well in time to prevent faults in machines.				
Workshop Activities	Machinery left unattended while leaving the engine turned on.	People/ Equipment	3x4=12	Single	Machinery being left on is common in construction.	Warning	• Never leave the machinery with turned on engine unattended.	3x4 = 12	Unlikely to drop the likelihood down to 2 (“Possible”)	Warning	Workshop Supervisor
	Fire	People/ Property	3 x 4 = 12	Multiple	While there is potential for multiple fatalities, the likelihood of multiple would be lower and the risk ranking lower accordingly.	Warning	• Combustible material shall be stored away from ignition source. • Firefighting equipment shall be made available for catering fire emergency. • Fire response training for workers will be provided. • Routine, periodic inspections to be carried out to identify fire hazards and confirm controls are in place.	2 x 4= 8	Likelihood decreased due to proactive hazard control.	Medium	Workshop supervisor



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	Lack of guards or inadequate Safety guards	People	5x5 = 25	Multiple	Guards are in place to prevent exposure of workers to damaging energies. In absence of these controls there is potential for multiple fatalities.	High	• All plant including infrastructure and mobile equipment must have a routine preventative maintenance inspection program based on the original equipment manufacturers (OEM) recommendations and site standards. • Prestart inspection requirements. • Maintain conveyor belt systems to avoid jamming and use care in clearing jams. • Ensure that guards are in place to protect workers • Establish and follow effective lockout/tagout procedures when servicing equipment.	3 x 5 = 15	Guards are maintained by administrative controls dropping the likelihood, but the severity does not change.	Warning	Workshop Supervisor
	Trailing wires and cables	People	3x4 = 12	Single	Tripping/running over cables lying on the ground is very common in construction.	Warning	• Cables shall be arranged to avoid damage to cables & trip hazard. •	3x4 = 12	Unlikely to drop the likelihood down to 2 ("Possible")	Warning	Workshop Supervisor



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	Electric shocks, burns, or fires.	People	4 x 5 = 20	Multiple	Faulty electrics could cause electrocution. Possibly resulting in a fatality.	High	• All plant including infrastructure and mobile equipment must have a routine preventative maintenance inspection program based on the original equipment manufacturers (OEM) recommendations and site standards. • Inspect the machine prior to commencement of drilling activity. • If defects are identified the machine is to be isolated tagged out shall not be used until repaired. • Electrical system shall be properly grounded. • ELCB or RCD circuit breaker shall be installed. These breakers will trip automatically in case of current leakage or overload. • Combustibles shall be removed. • Electrical grounding shall be ensured. • Earth leakage circuit breaker shall be installed. • Cables shall be arranged properly to prevent damage. • Periodic electrical inspection shall be conducted.	2x5 = 10	Controls rely on behavior. Potential controls are not effectively put in place.	Medium	Workshop Supervisor
Camp	Electrical shocks	People/Property	4x5 = 20	Multiple	Faulty electrics could	High	• All plant including infrastructure and mobile equipment must have a	2 x 5 = 10	Controls rely on	Medium	Camp In charge

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Risk Register

					cause electrocution. Possibly resulting in a fatality. Potential for multiple casualties.		routine preventative maintenance inspection program based on the original equipment manufacturers (OEM) recommendations and site standards. • Inspect the machine prior to commencement of drilling activity. • If defects are identified the machine is to be isolated tagged out shall not be used until repaired. • Electrical grounding shall be ensured. • Earth leakage circuit breaker shall be installed. • Cables shall be arranged properly to prevent damage. • Periodic electrical inspection shall be conducted.		behavior. Potential controls are not effectively put in place.		
	Fire	People/Property	3 x 4 = 12	Multiple	While there is potential for multiple fatalities the likelihood of multiple would be lower and the risk ranking lower accordingly.	Warning	• Combustible material shall be stored away from ignition source. • Firefighting equipment shall be made available for catering fire emergency. • Fire response training for workers will be provided. • Routine, periodic inspections to be carried out to identify fire hazards and confirm controls are in place.	2 x 4 = 8	Likelihood decreased due to proactive hazard control.	Medium	Camp In charge



Date: April -2025

Site: Infra 1

Risk Register

	Hot weather	People	2x4 = 8	Single	Dehydration resulting in heat stroke is a known cause of death in the construction industry.	Medium	- Implement controls shown in “Mobile Equipment Operation - Dehydration” while working in hot weather” above. - Cooling facility (Fans, AC) shall be provided. - Drink Approx. 250 ml water every 15-20 min. - Drink at short intervals rather than large amounts infrequently. - Don’t drink more than 1.5 litres. per hour. - Provide sufficient shaded shelter areas for workers cool down.	2 x 4 = 8	Controls are behavioral based and potentially not complied with.	Medium	Camp In charge
	Cold weather	People	2x4=8	Single	Unlikely that without controls someone would pass away from the cold.	Medium	Warm clothing shall be worn while working in cold weather.	1x4=4	Unlikely that without controls someone would pass away from the cold.	Low	Camp In charge

Note: OHS team shall monitor all activities for compliance & implementation of this documents.

Construction Manager:
Signature

OHS Officer:
Signature



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Risk Register

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